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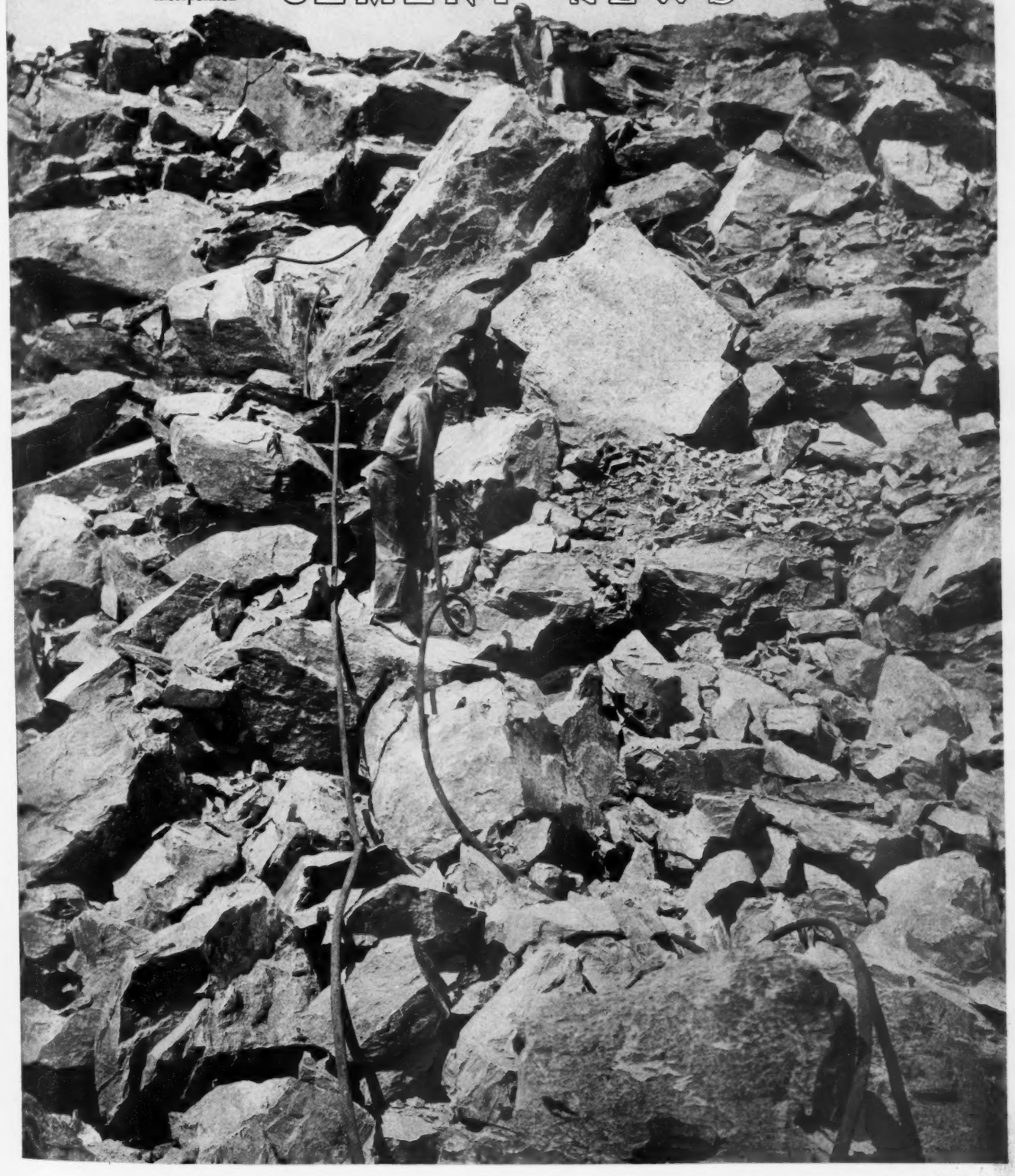
Rock Products

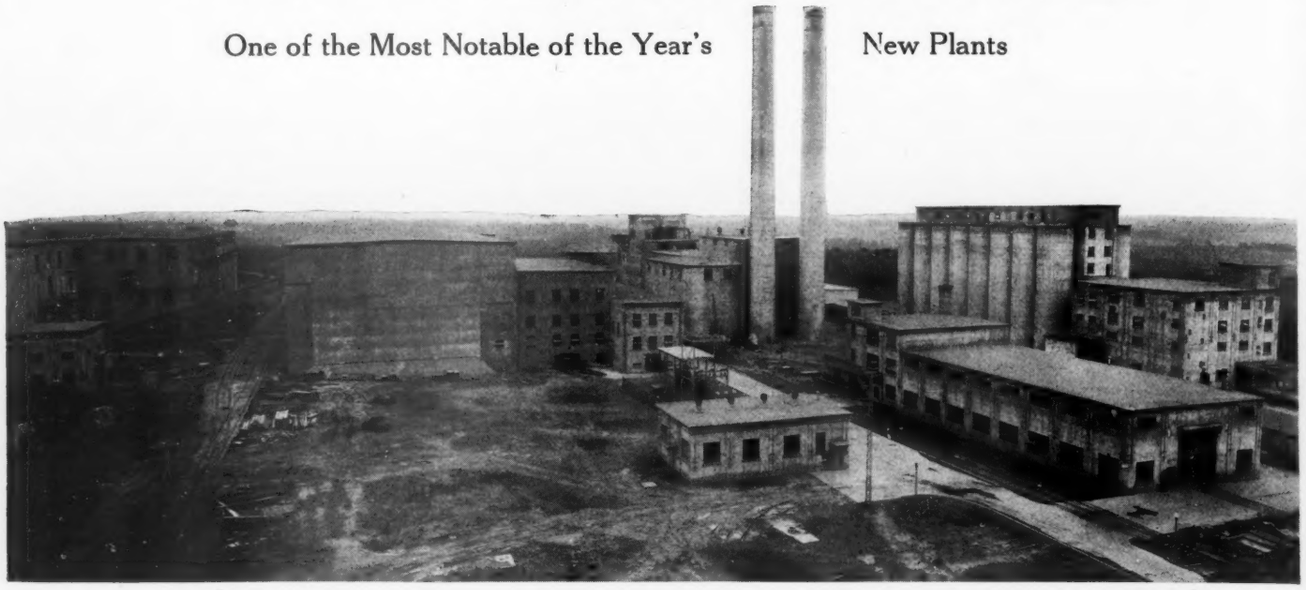
With which is Incorporated CEMENT and ENGINEERING NEWS Founded 1899



Quarrying at the Lawrence Portland Cement Co.'s operation at Thomaston, Maine

Lawrence Portland Cement Co.'s Plant at Thomaston, Maine

One of the Most Notable of the Year's New Plants



Panorama of the new Thomaston plant as seen from the Lawrence company's lime plant, which is adjacent

THE first cement came from the kilns of the new plant of the Lawrence Portland Cement Co. at Thomaston, Maine, 11 months from the time that ground was broken for its construction. When one considers the difficulties that attended its construction, due to the nature of the ground, the rigors of a winter on the Maine coast, and the difficulty of obtaining supplies and equipment quickly, this is a somewhat remarkable construction record.

The plant is remarkable in other and more important ways, however. The construction methods, especially the extended use of the slip form, are, in the opinion of those who have had charge of the work, a distinct advance over methods previously employed. Much of the equipment is of the very newest design. Unusual pains were taken to build a plant that would operate during the most severe weather, and to make one

A view in the quarry of the new Lawrence plant, with the electric shovel loading to one of the 10-yd. side-dump cars, Note the character of the rock in the quarry face

that would be dustless, and there are some novelties in design and practice that will be noted in the course of this description.

The new plant is the first cement mill to be built in New England, of a modern type. The only other cement plant ever built was a small vertical kiln plant erected many years ago.

The New England states are largely in a granite region, and the materials for making cement are found in only a few places. The nearest to the great central market, the Boston area, not in miles but in transportation cost, is the Rockland district on the Maine coast, in which the new plant is built. Here

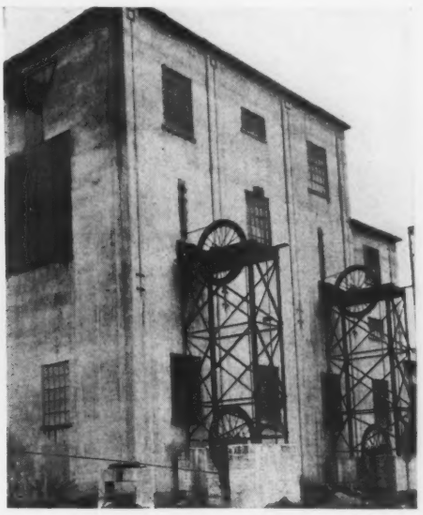
Well drill at work in the Thomaston quarry

is one of the few outcrops of limestone in New England, an elongated and broken exposure which has been folded and bent by the intrusion of igneous rocks. (An aeroplane view of this deposit appeared on page 41 of Rock Products, September 1, 1928.) This limestone deposit has been of great economic importance in the past, for it has sent lime to Boston and other coast towns from early colonial days. Water transportation made this possible and a fleet of 40 "lime coasters" at one time sailed from Rockland harbor. The same water transportation is now bringing coal and other supplies to the new plant.

It was long recognized that the Rockland district was a logical place for a cement plant and several efforts to organize a company to build one have been made. The

Dumping a quarry car to the receiving hopper by an electric hoist

most successful of these, the New England Portland Cement and Lime Co., was taken over by the Lawrence company after a site had been secured and organization pretty well completed. By doing this the Lawrence company acquired title to about 800 acres of land, on which are the quarry and the clay pit for raw materials and an extensive harbor frontage, and the right to build and operate a railroad from the harbor to the plant. A careful analysis of operating and transportation costs was made to determine whether the plant should be built on the water front or at the quarry, and the advantages were found to be in favor of the quarry site. Mechanical equipment on the dock and an arrangement with the Maine Central Railroad for transferring and switching cars made this so. The unloading equipment was used in the construction period to deliver about 5000 tons of coal and for shipments of gypsum, and in the future ships

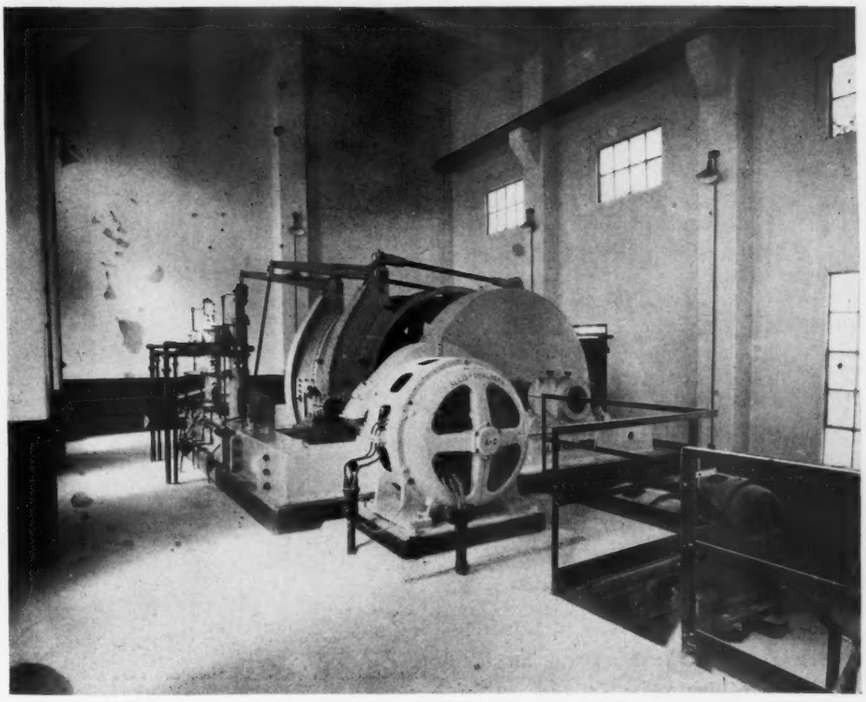


The rear of the crusher house showing the sheaves for the hoisting ropes

that bring in coal and other bulk cargoes will probably go out laden with cement.

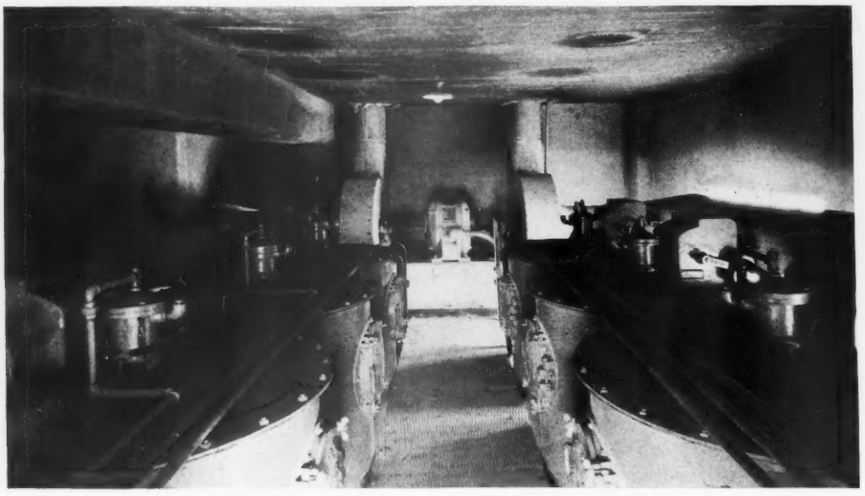
Quarry and Crushing Plant

The quarry had been operated to a depth of 45 ft. by the New England company, which used the stone for burning lime in the plant described in Rock Products, issue of September 1, 1928. At this depth the quarry is in a high grade calcium stone, but above



The hoist for raising the quarry cars to the crusher with the 250-hp. motor which operates it

this the lime content is less, the ledge in some parts having about the lime content of "cement rock." High and low calcium stone are quarried together and mixed in storage to produce a uniform grade. The formation, which is known to geologists as the Rockland formation, is of somewhat doubtful age as it has been partly metamorphosed and folded by the intrusions of granite, but it is thought to be of Cambrian origin by those who have studied it recently. The dip varies, but averages something like 60 deg. from the horizontal, and the stone has been found by core drilling to go hundreds of feet below the surface. The resources are more than any plant can exhaust in several lifetimes.

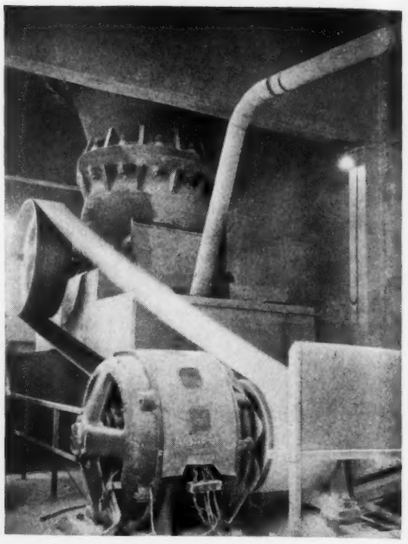


Dust collector installation in the crusher house

An opening in the ledge was made soon after beginning to build the plant and this has recently been connected with the lime quarry, so that the present pit is a trench of irregular shape about 1500 ft. long and 100 to 150 ft. wide. There is nothing unusual in the quarry methods; holes are put down by a Sanderson-Cyclone well drill and shot in the usual way and secondary shooting is by the use of Ingersoll-Rand jackhammer drills. The broken rock is loaded by a No. 37 Marion electric shovel with a 1¾-yd. dipper and an Erie steam shovel with a 1-yd. dipper. The cars are let down the inclines from the crushing plant close to the shovels, and as there are two inclines, the hoisting is in balance. The cars are standard gage, 10-yd. capacity, and are of the "Phoenix" side-dump type, made by the Easton Car and Construction Co. They are raised to the top of the crusher house by an Allis-Chalmers hoist of the remote control type which is in a separate house with its 250-hp. motor, oil pump compressor and other accessories. The hoist has a governor to prevent overspeeding and limit switches which apply the brakes if the car runs past the dumping point.

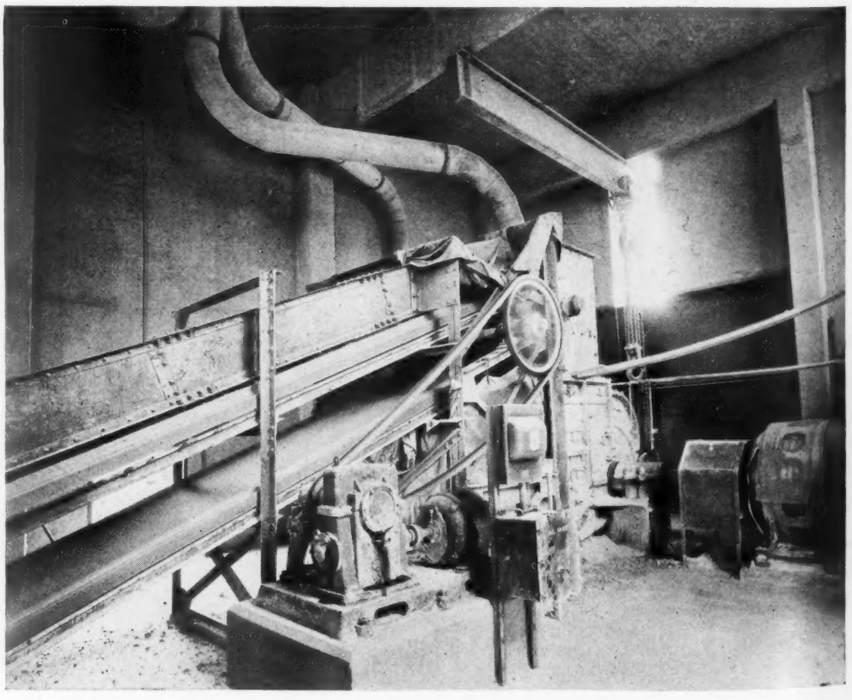
At the top of the incline the cars come in on horizontal tracks laid on both sides of the crusher hopper, which is about 20 ft. square. The hopper is built directly over the head of the 42-in. Allis-Chalmers gyratory, primary crusher. The cars are dumped by two 8-ton Shepard electric hoists that run on trolleys over the hopper. They can be hooked on to the cars manually or by an automatic device, by the use of which all the operations of hoisting and car-dumping can be controlled by the hoist man who sits in a cabin above the crusher hopper.

The cars are brought back to the incline by an ingenious device. It consists of two counterweights attached by cables to rings that are held by hooks at the top of the incline. When a car is pulled on to the floor two hooks fastened to the car frame catch in the rings and pull them in with the car raising the counterweight. After the car has been dumped the weight of the counterweights is sufficient to pull the car back to the incline where the rings catch on the stationary hooks and are released from the hooks on the car. (This device was illustrated and described in more detail in the "Hints and Helps for Superintendents" department of the June 9, 1928, issue.)



The 42-in. gyratory, primary crusher with its motor and dust collecting pipe

The discharge of the primary crusher goes to a Chain Belt Co.'s 40-in. pan conveyor about 40 ft. long. This discharges directly into a No. 8 Williams hammer mill crusher of the "Jumbo" type, which crushes it to about 1-in. size. It is then fed to a 30-in. in-



Pan conveyor from the primary crusher delivering material to hammer mill showing the speed reducer drive on the crusher, and also the dust collection pipes

clined Robins belt conveyor, about 150 ft. long, to a 30-in. distributing belt that runs the length of the stone storage. This belt is placed inside the hollow wall, of cellular construction that will be explained later, and distributes the stone through windows opening into the stone storage. An automatic traveling tripper permits the stone to be discharged through any window. This is one of the novel features of the plant and it was made possible by the use of slip-form construction for the storage walls.

The crusher house is fully equipped with Norblo dust collectors. An unusual feature of this installation is the placing of an intake where the discharge belt drops the stone from the crusher to the storage bin, removing the fine dust.

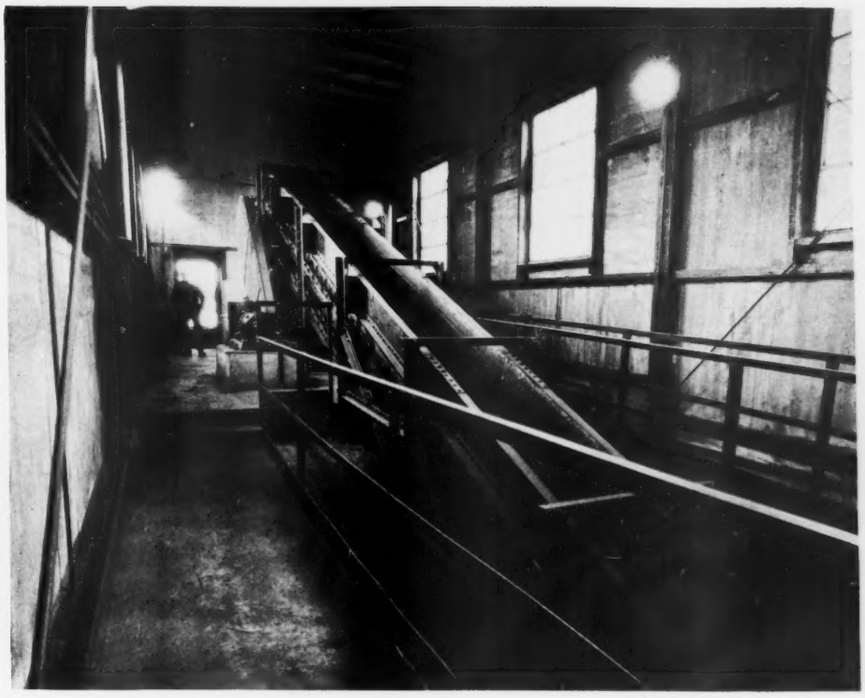
The stone storage is a part of the storage building which also contains the gypsum storage and clinker storage. There are two "P. and H." cranes, made by the Harnischfeger Corp., Milwaukee, Wis., one at the stone end and one at the clinker and gypsum end. Both are of 15 tons capacity and handle 3-yd. Hayward buckets. The crane over the stone storage distributes the stone and transfers it to the bins over the raw grind mills.

TYPICAL LIMESTONE ANALYSIS

Silica (SiO_2)	1.12%
Alumina (Al_2O_3)	0.35
Iron Oxide (Fe_2O_3)	0.11
Lime (CaO)	54.75
Magnesia (MgO)	0.12
Loss on ignition	43.96
	100.41%

Clay Handling and Preparation

A more elaborate system than is usually found in cement plants is used to prepare the clay for the raw mix. The clay is dug from a pit about 1000 ft. from the plant. It is part of the overburden of the quarry rock, which varies from 12 to 30 ft. in thickness. In some places this overburden is glacial till, in others it is said to be a marine deposit, of comparatively recent geological formation, filling old erosion channels. This is uniform in analysis and

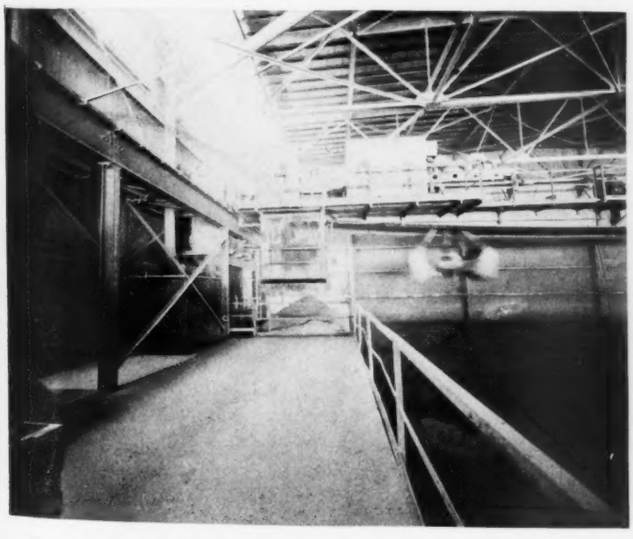


Pan conveyor delivering coal from the track hopper to the crusher in the background

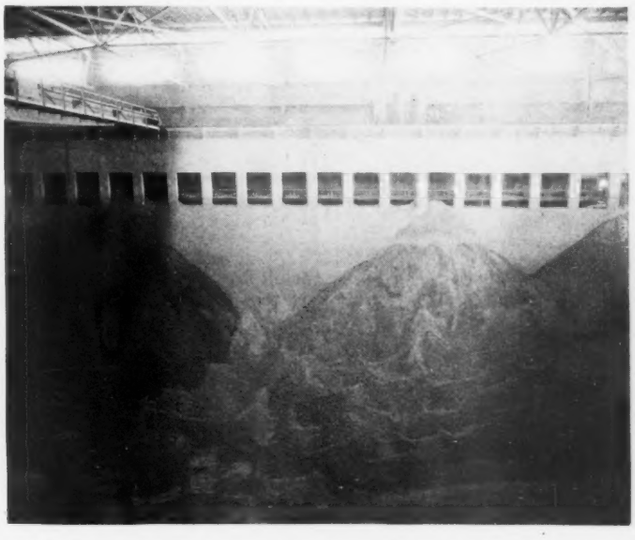
of an excellent quality for making cement. It is dug by a Thew dragline and loaded into 6-yd. "Western" side-dump cars and drawn into the clay storage by 8-ton Vulcan gasoline locomotives, of which there are two at the plant.

The clay storage is much larger than is usual, but this is to provide an ample quantity of unfrozen material to carry the plant through the longest periods of cold weather. The storage space is 150x50 ft. with walls 50 ft. high. Provision is made to heat it sufficiently to keep the clay from freezing. It is spanned by a Harnischfeger crane with a 3-yd. Hayward bucket that distributes the clay and puts it in the hopper of the pug mill. The pug mill is of a standard type, made by the American Clay Machinery Co., except that extra space is left at the ends so that the blades will not catch on occasional large stones that come in with the clay. From the pug mill the clay goes to a pair of stone separating rolls of the same make as the pug mill. Mill and rolls are driven by one 75-hp. motor through a "Texrope" drive.

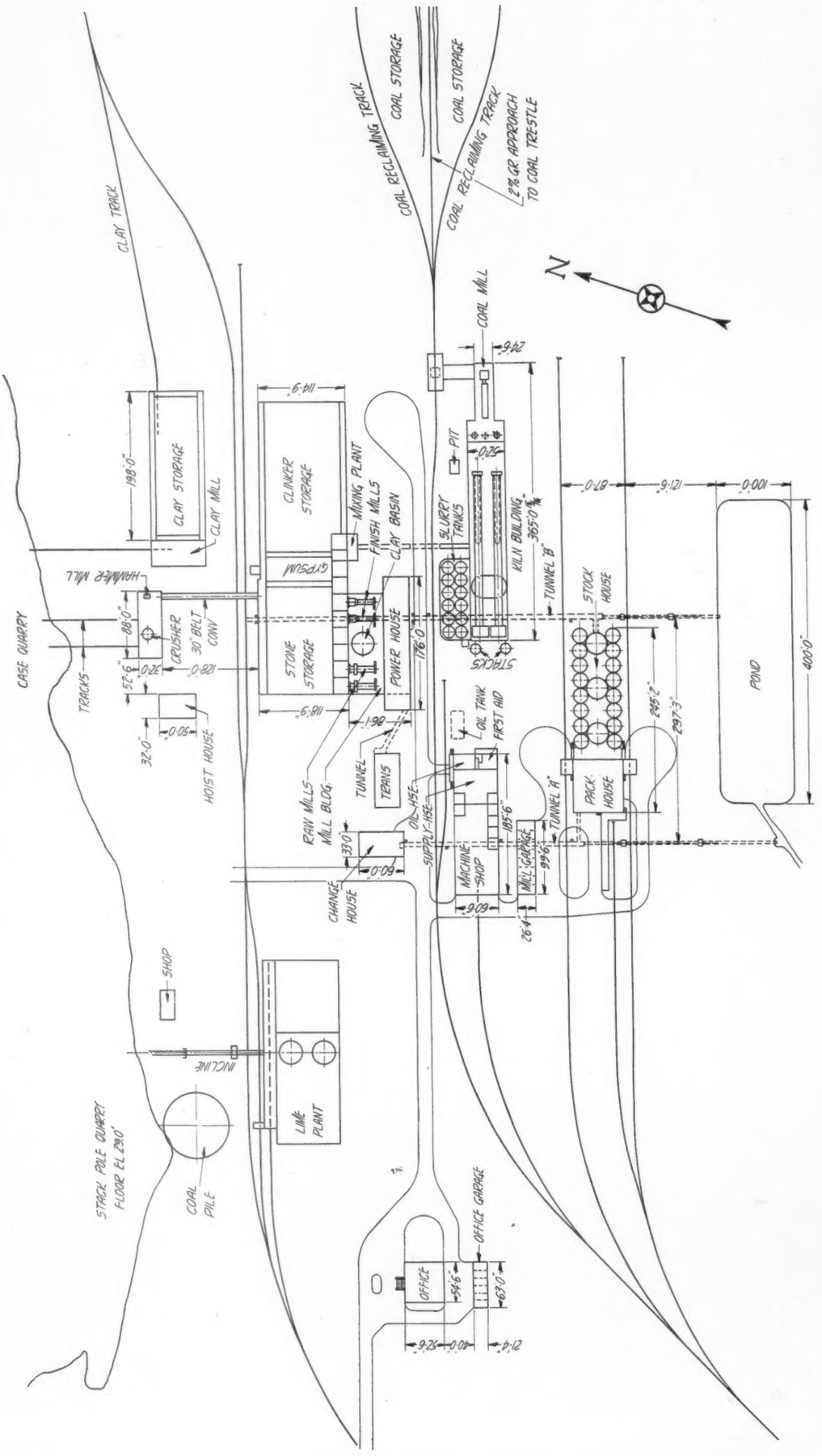
The clay, now freed from stones, is pumped to an Allis-Chalmers 26-ft. wash mill where it is mixed to a slip for grinding with the limestone. It is pumped from the wash mill about 150 ft. to a clay storage basin in the grinding department, standing between the raw grind mills and finish grind mills. Both these pumps and all the other



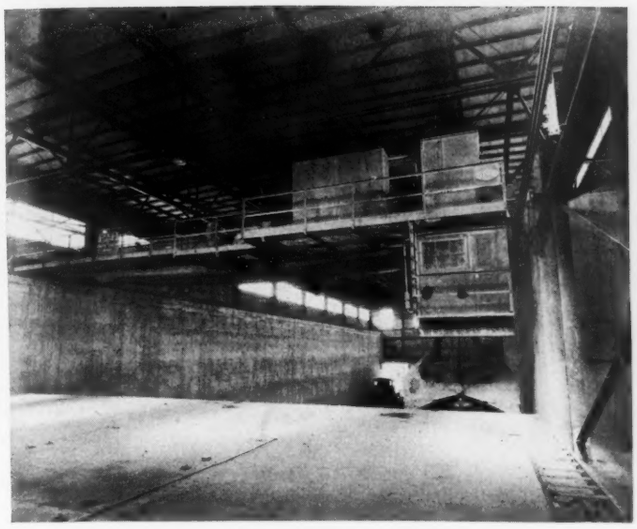
Rock storage with 15-ton traveling crane equipped with a 3-yd. bucket



Distributing belt installed in the gallery beside the stone storage with tripper sending rock to the storage



General plan of the Lawrence Portland Cement Co.'s operation at Thomaston, Me.



Clay storage with one of the two 15-ton cranes, equipped with a 3-yd. bucket

Gas locomotive (in the far corner) delivering material to the clay storage

pumps in the plant for handling clay or slurry are Wilfley centrifugal pumps, 11 being in service. Most of them are driven by 25-hp. motors, direct connected. Those which pump the clay to storage and which pump slurry from the raw mills to the correction tanks have 40-hp. motors, direct connected.

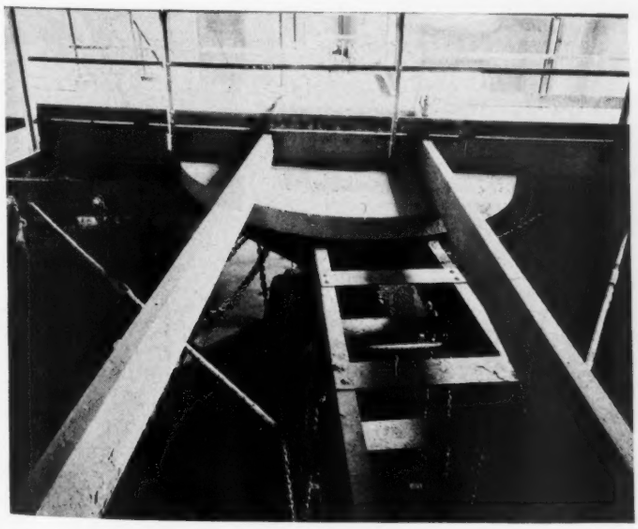
The clay storage basin in the mill house is 30 ft. in diameter and 22 ft. high. It is provided with a Minogue agitator, made by the Manitowoc Engineering Works, a combination of arms that sweep the bottom of the tank provided with plow shaped teeth and air jets.

Clay is pumped from the storage basin to two clay feeders placed over the raw grind mills. These are of Allis-Chalmers make, of the Ferris wheel type with wheels driven by a variable speed, direct-current motor through a chain and Philadelphia Gear Works speed reducer. Practically all of the speed reducers in the plant are of this make.

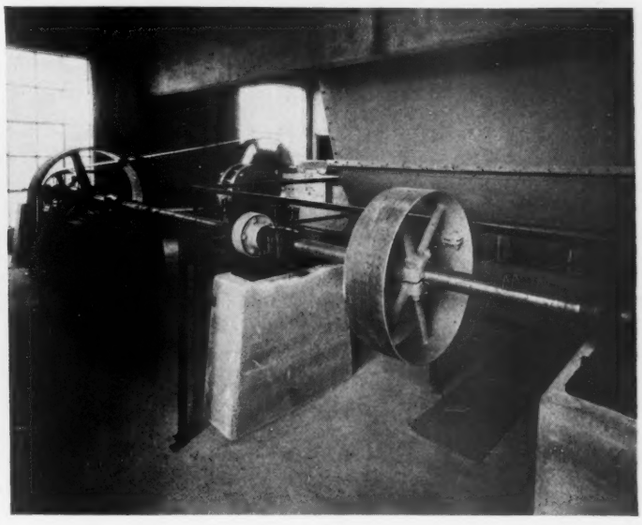
TYPICAL CLAY ANALYSIS

Silica (SiO_2)	61.76%
Alumina (Al_2O_3)	18.08
Iron Oxide (Fe_2O_3)	7.92
Lime (CaO)	1.34
Magnesia (MgO)	2.80
Loss on ignition, etc.	8.10
	100.00%

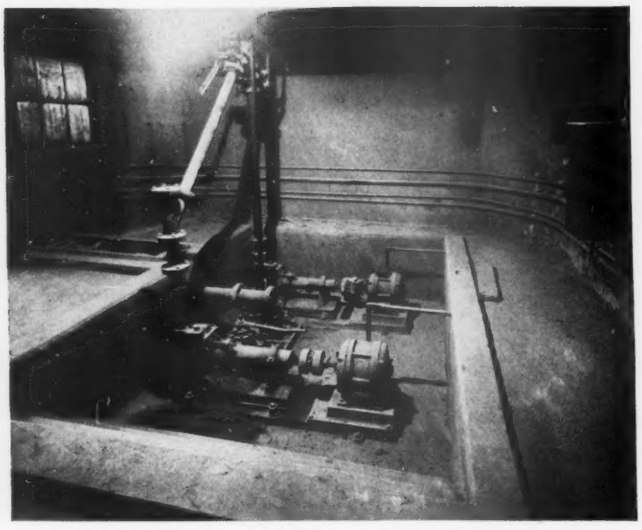
Bringing clay from the pit to the plant with a gas locomotive and side-dump cars



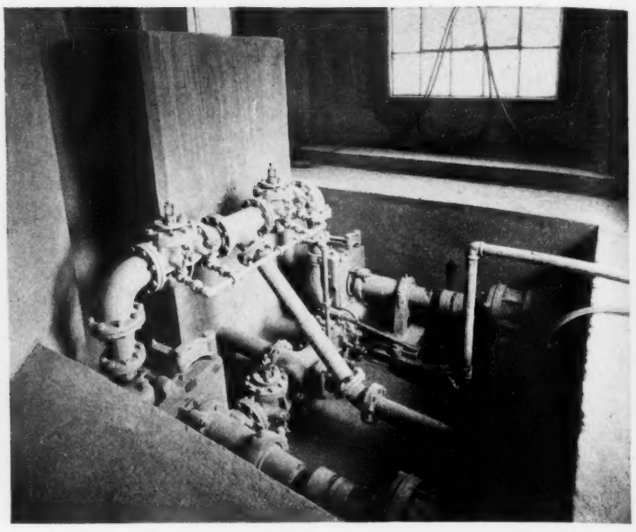
Clay wash mill



Pug-mill motor and drive running mill and rolls



Pumps which send clay from raw grind mill to the clay feeders

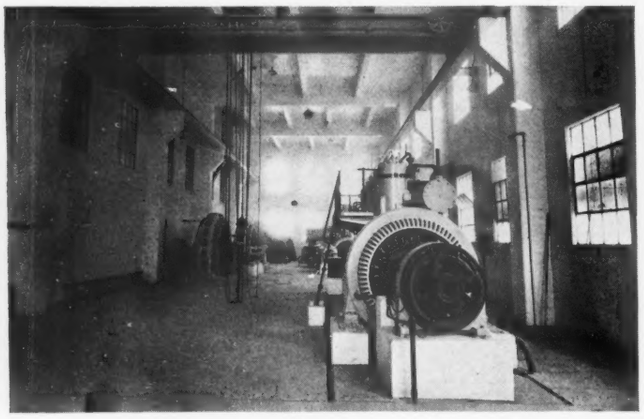


Pumps for delivering clay slurry from the wash-mill to the clay storage basin

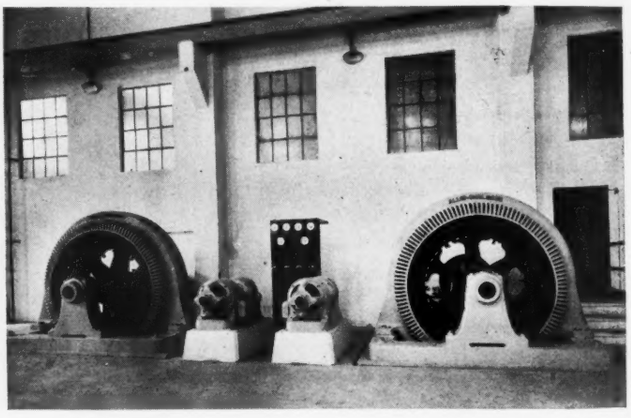
Raw Grinding and Slurry Departments

The limestone is fed to the raw grind mills by Allis-Chalmers table feeders, a type which is capable of very close adjustment. Feeders for both clay and limestone are interlocked electrically with the mills they serve so that the motors driving the feeders are thrown out as soon as the mill with which they are connected stops. This is one of the novel features of the plant and like many of the others it was worked out by C. H. Sonntag, the consulting engineer.

The mills are Allis-Chalmers three compartment "Compeb" mills, 40 ft. long and 8 ft. and 7 ft. in diameter. Chrome steel



Large motor room in the new powerhouse



Two 800-hp. motors driving the compeb mills

Clay feeders over the raw grind mills

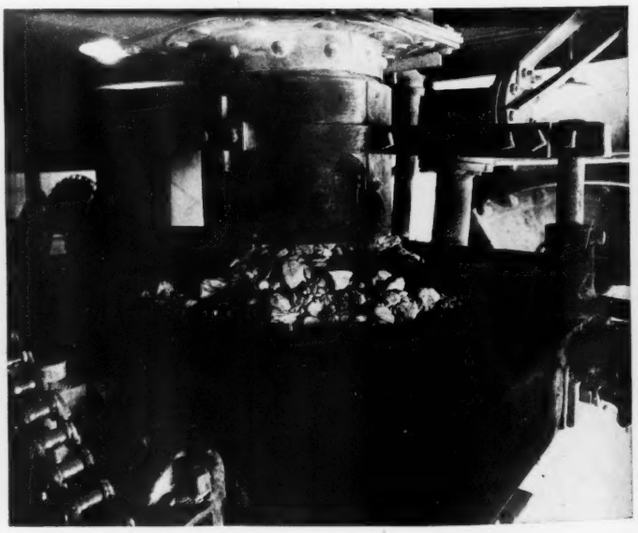
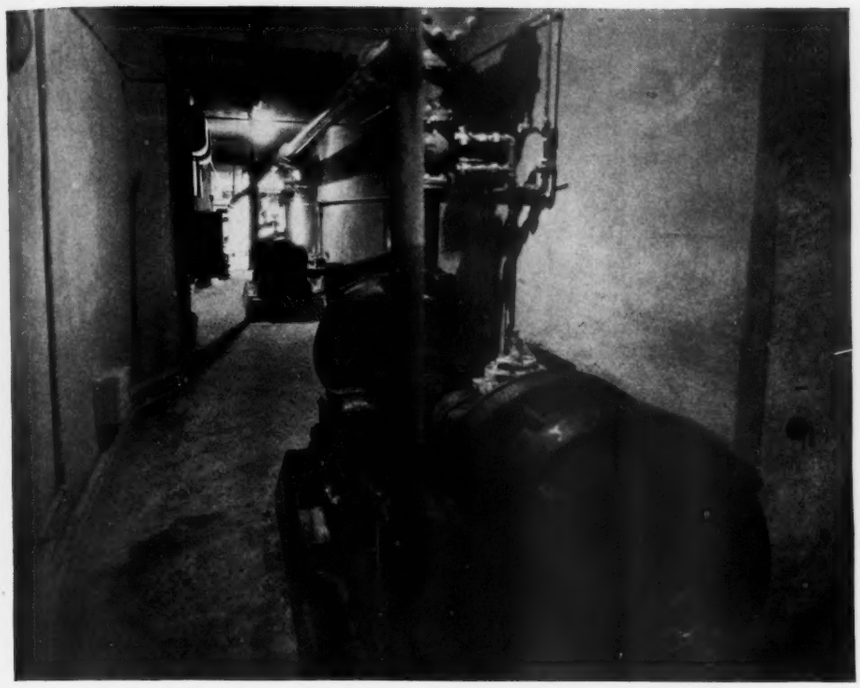


Table feeders for the raw grind mills



Slurry pumps for delivering finished clay slurry to the correction tanks in the kiln house

balls of 3-in., 4-in. and 5-in. diameters are used in the first compartment and of 2-in. and 1½-in. diameters in the second compartment. Allis-Chalmers "concavex" is used as a grinding medium in the third.

These mills are driven by the new Allis-Chalmers "Hytork" motors, which will be more fully described with the electrical equipment. The motors, which are of 800-hp., are direct-connected to the pinion shaft of the mill and mill and motor are started by merely turning a knob like an ordinary door knob. The building up of the speed is done automatically. Stopping a mill is only a matter of pushing a button.

The slurry from the raw mills goes by Wilfley centrifugal pumps to 12 correction tanks in the kiln house. These are all of 16 ft. diameter and 26 ft. high and they are supplied with Hill Clutch and Machine Co. "Tubular" agitators, a new device described in Rock Products, August 4, 1928, p. 120.

Transfers for correction are made by Wilfley pumps, of which three are connected to the correcting tanks and the kiln feed tanks, the pipe lines permitting transfer from any tank to any tank. Nordstrom valves are used throughout on all slurry and clay lines —about 50 in all.

The kiln feed tank is under the kilns and it is 45 ft. long and 30 ft. wide, the ends being circular. The slurry is pumped from this to two Allis-Chalmers kiln feeders of the same type as those used for feeding clay slip to the raw grind mills, the excess slurry being returned to the tank in the usual way. The kiln feed tank contains two Minogue agitators.

Kilns and Coal Mill

There are two kilns installed, and the mill is designed so that others may be added as the demand for the plant's product is increased. They are of Allis-Chalmers make, 11 ft. in diameter and 200 ft. long. The kiln refractories were supplied by General Refractories Co. It was not considered advisable to install waste-heat boilers with these kilns, but the space is available should they be required later.

Each kiln is supported by four 2-roller bearings, and the drive is a 75-hp. slip-ring motor with cut steel gearing. A feature of this drive is that motor and gears are mounted on a solid bed plate, set parallel with the kiln, so that the shafts cannot get out of alignment.

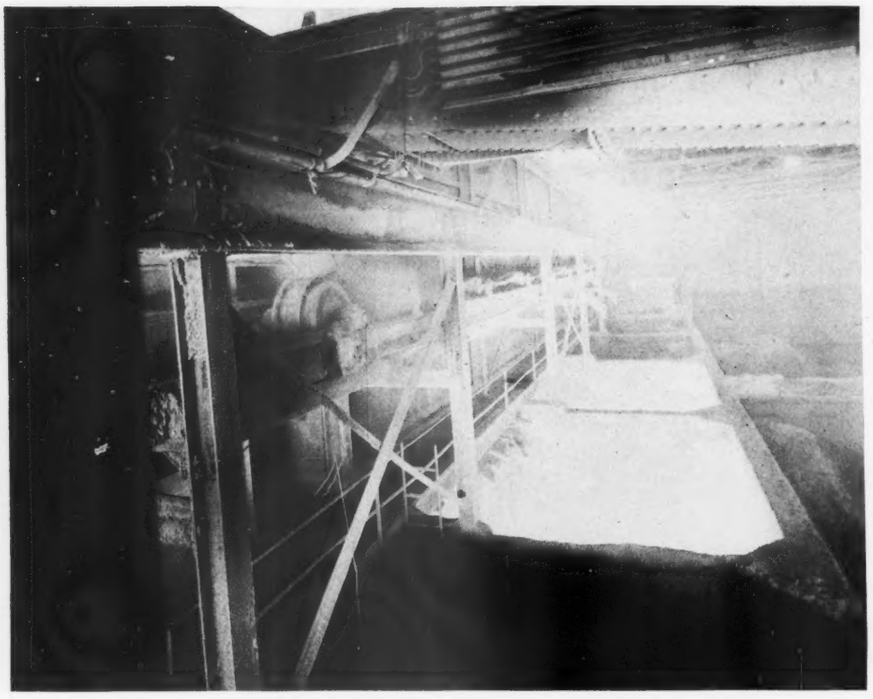
The coolers, 90 ft. long and 10 ft. in diameter, are among the largest that have been made. The clinker is cooled in them almost to atmospheric temperature. The first 30 ft. is lined with fire brick, the remaining 60 ft. is provided with the usual channel iron lifters to raise the clinker and allow it to "shower" through the incoming current of air. As more air is required to cool the clinker than can be passed through the kilns, arrangements were made to discharge part of the heated air outside.

Pulverized coal for kiln fuel is prepared in an exceptionally well built and planned coal mill, placed at the end of the kiln building. Coal is received in bottom-dump railroad cars, which discharge into a track hopper that feeds to a Latimer pan conveyor, and this discharges directly into a Pennsylvania single-roll crusher which breaks the coal to 1-in. size. Then it is elevated to a hopper from which it is fed by gravity to a 40-ft. Ruggles-Cole dryer, driven by a 35-hp. motor through a Cleveland speed reducer. The dried coal is elevated to the Raymond mill feed bins.

The two Raymond mills, which are in a

New style of tubular agitator in the correction tanks

The pipe and valves above the correction tanks



The raw grind bins and, at the left, the drag chain which runs over them

room separated from the dryer, are of the low-side, four-roller type and each is driven by a 110-hp. motor, direct-connected to the mill. The Raymond air separating system is used to take out that part of the product sufficiently ground and return the remainder to the mill, a Buffalo Forge Co.'s fan and a 40-hp. motor furnishing the suction. The powdered coal is fed into the kilns by Bailey feeders with Sturtevant blowers.

One of the most novel features of the coal mill is the Norblo dust-collecting system—the first to be installed in a coal mill. All of the elevators, bins, Raymond mills and the dryer are connected, so that the air of the coal mill is about as free from coal dust as it is possible to make it.

Clinker Grinding

The clinker from the coolers falls on a 6-in. drag chain of heavy construction, which was made especially for this plant by the Bethlehem Foundry and Machine Co. It takes the clinker about 150 ft. to the mixing plant, a small building set close to the clinker storage, where it is mixed with gypsum. The drag discharges into a 60-ft. elevator that lifts the clinker to a storage bin, an overflow from this bin allowing the clinker to flow into the clinker storage. When clinker from storage is wanted it is taken by the crane and put back into this same bin so that it can pass through a Schaffer poidometer fed from the bin. A similar bin and poidometer weighs out the gypsum, and gypsum and clinker mixed go to an elevator that lifts them to a drag chain, similar to that used for bringing clinker from the coolers. This drags the mixture to the finish grind mill feed bins.

The method of mixing clinker and gypsum before grinding is not so usual as that of employing separate feeders for gypsum and clinker before the finish grind mills. But it has been successfully employed in the Lawrence plant at Siegfried, Penn., for a long time and hence it was included in the design of this plant, as it simplifies the feeding arrangements.

Gypsum is brought to the plant by rail. Cars are unloaded over a track hopper from which the gypsum is taken by a Chain Belt pan conveyor to a Pennsylvania hammer mill driven by a 100-hp. motor. An elevator lifts it so that it can fall by gravity into the gypsum storage, and the same crane that handles clinker takes it from this storage and puts it in the bin over the Schaffer poidometer mentioned.

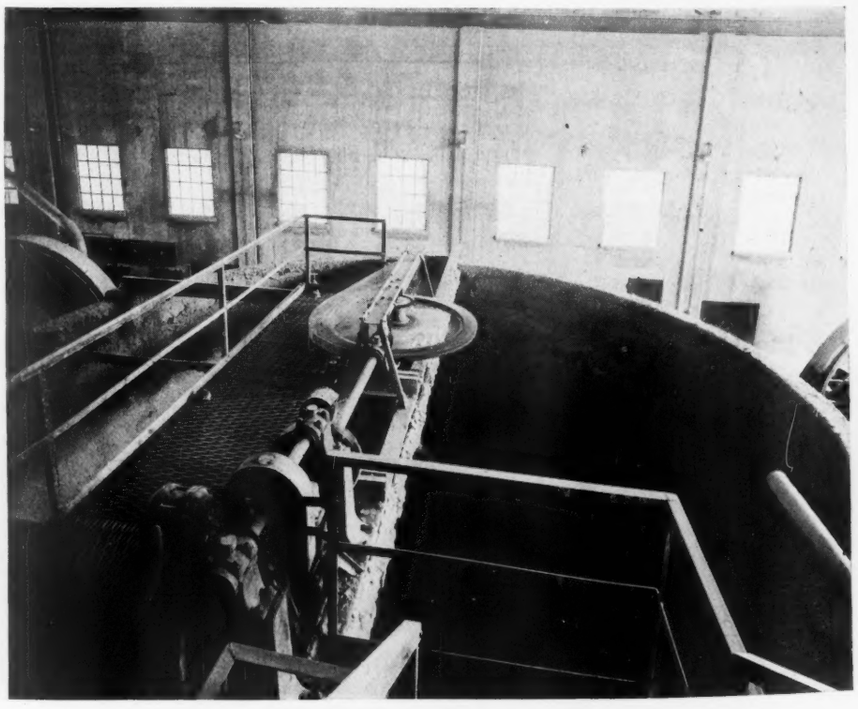
The two finish grind mills are Allis-Chalmers "Compebs," 7 and 8x40 ft., very much like the mills on the raw grind side, and driven by similar 800-hp. "Hytork" motors. They are fed by table feeders with mixed gysum and clinker. The mill discharge, now cement, falls to the hopper of a 6-in. Fuller-Kinyon pump set in the basement of the power house, which adjoins the mill house. The Fuller-Kinyon line is about 600 ft. long over all and it rises almost 100 ft. to the system of pipes above the silos in which the cement is stored. The line goes in a tunnel underground and is accessible at all points.

The finish grinding plant is also notable for its dust-collecting system. Norblo dust collectors are connected to the mills and air-sweep the clinker during grinding, cooling the discharge to about 180 deg. F.

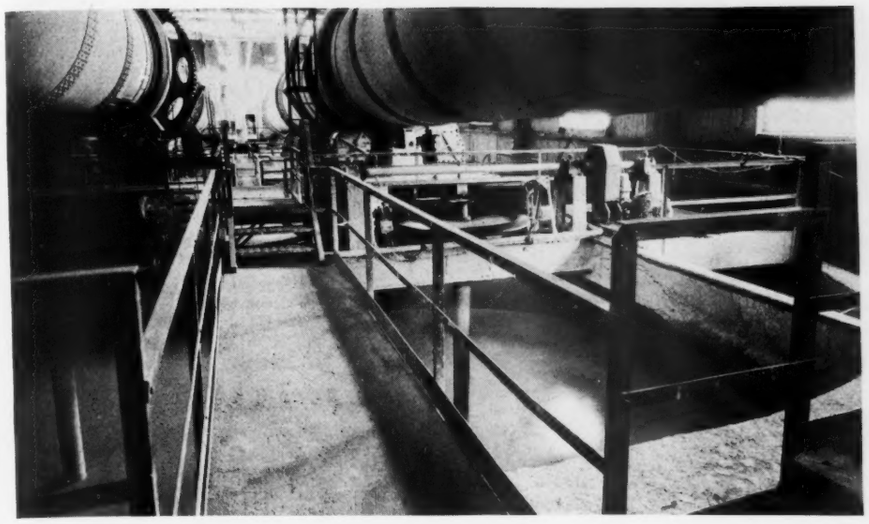
Storing and Packing Cement

All the silos are 80 ft. high. Sixteen are 20 ft. in diameter and placed in two rows of eight. Between the rows are three silos 30 ft. in diameter and two spaces about 30x30 ft. also used as bins. The total storage is about 150,000 bbl.

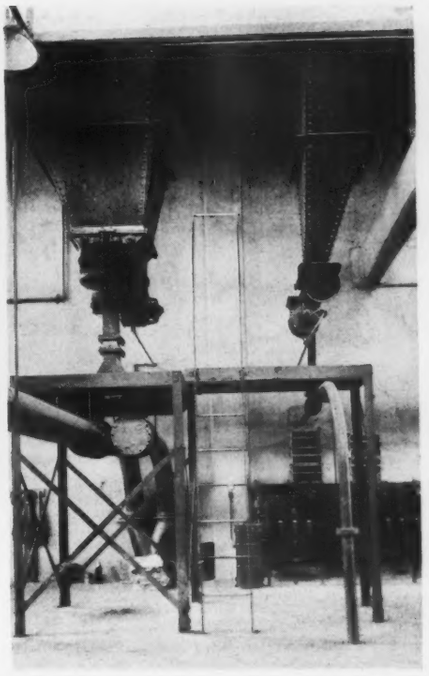
Cement is recovered from the silos by three 16-in. screws running under them for their full length, the drives being 50-hp. motors and Philadelphia Gear Works speed reducers. The screws discharge to a 60-ft. elevator that lifts the cement to the bins over



The finished slurry tank equipped with agitator



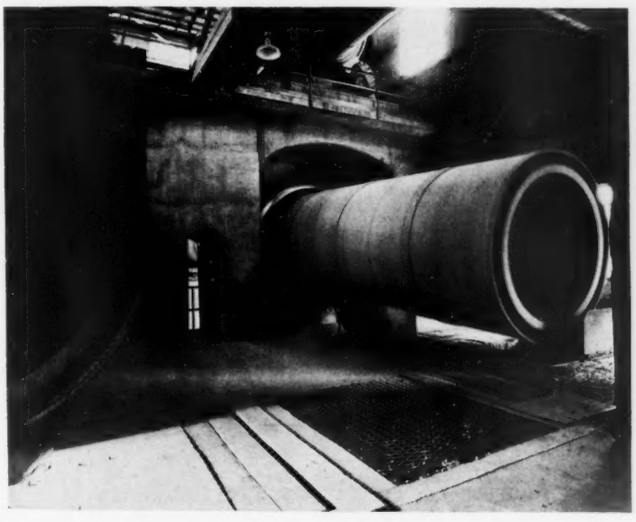
Kiln feed tank, showing the motor, speed-reducer and one of the agitators



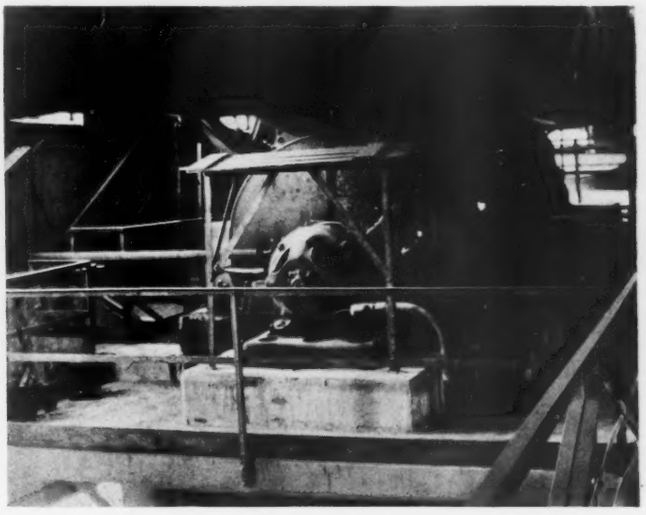
Coal feeder for one of the kilns and feeder for coal dryer

the four Bates valve-bag packers. These are of the three-valve type and they have the usual belts in connection for loading railroad cars that stand on both sides of the pack house.

the Allis-Chalmers Manufacturing Co. and it is interesting because it includes the "Hytork" motors driving the "compeb" mills and these are rather new in the cement industry. In fact, only a few of them are in use any-



The ends of the clinker coolers, which are among the largest in the world



One of the 75-hp. motors driving one of the kilns

On the floor above the packers is a Nazareth bag cleaner which is fed with bags that have been given a preliminary sorting on tables. The cleaned bags are elevated to the floor above where they go on a sorting belt. Bag storage and bag repair shop are on these upper floors. The pack house is served by a freight elevator of the usual type made by the American Elevator Co.

TYPICAL ANALYSIS OF FINISHED CEMENT

Silica	21.34%
Alumina	6.58
Iron oxide	2.64
Lime	64.02
Magnesia	1.56
Sulphur trioxide	1.80
Loss on ignition	1.32
	99.26%

Fineness, 86% through 200-mesh.

Special Features—Electrical Equipment

The electrical equipment was supplied by

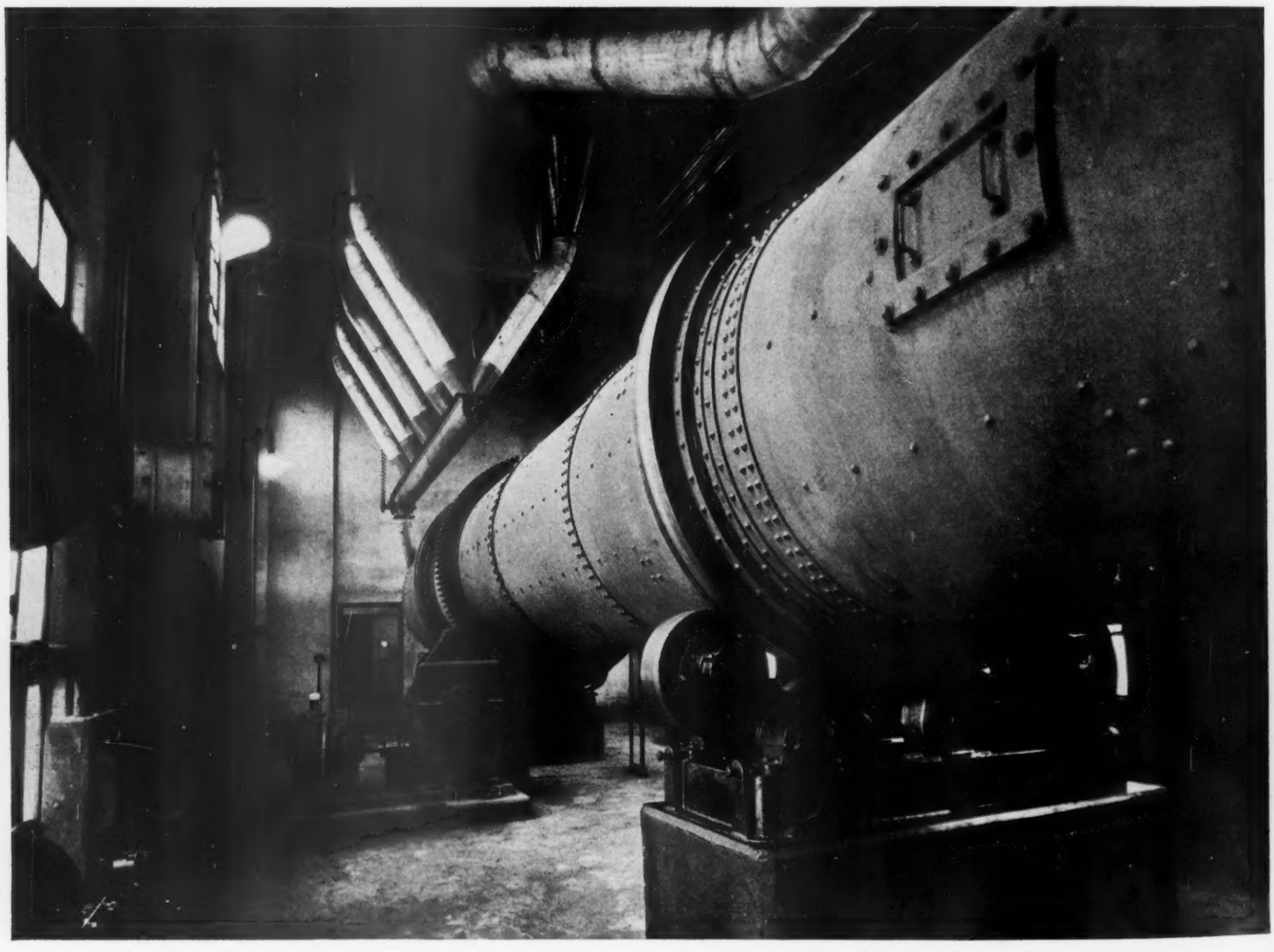
Dust collector installation on the top of the coal house

Automatic weighing equipment in the coal house

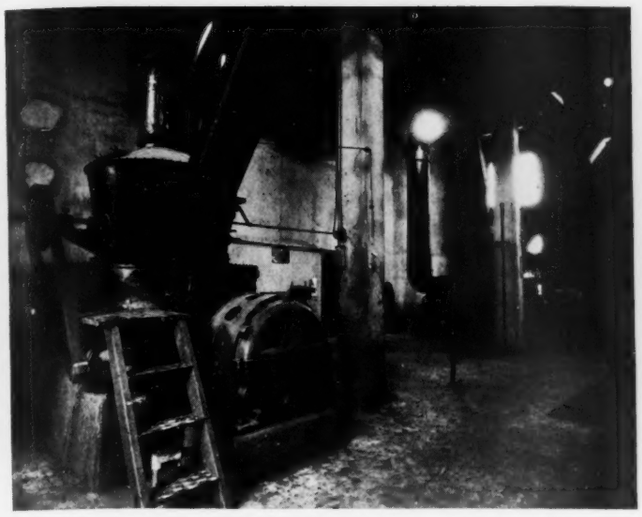
Blowers in the coal house for delivering powdered coal to the kilns

where. They are placed in the power house, which is a long and narrow building joined to the mill building and of the same length. The pinion shaft of the mill passes through the wall and is direct connected to the motor. On the upper floor of the power house are the mill motors, the main switchboard of the plant, two angle-compound Sullivan air compressors, each of 1800 cu. ft. capacity, driven by 300-hp. synchronous motors, exciters for these and the larger motors and a Fairbanks-Morse full-Diesel engine of 360-hp., which is connected to an Allis-Chalmers 250-kw. generator. This set is to be used for emergency operation of certain parts of the plant in case of a power failure. On the lower floor are the bus bars with disconnect and other switches, the automatic contactors for the "Hytork" motors, a storage battery and other machines, such as the Fuller-Kinyon pumps mentioned not directly connected with the electrical equipment.

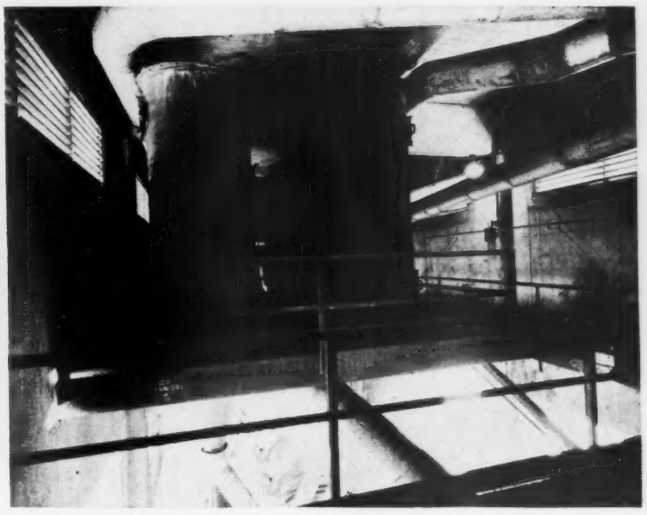
Current is purchased from the Central Maine Power Co., and, with the exception of one or two paper mills, the plant is said to be the largest user of electrical power in the state. A 50-mile line and a sub-station



Dryer for pulverized coal, showing its motor and speed-reducer drive, and the pipes up to the dust collector overhead



The two low-side, four-roller type mills in the coal house

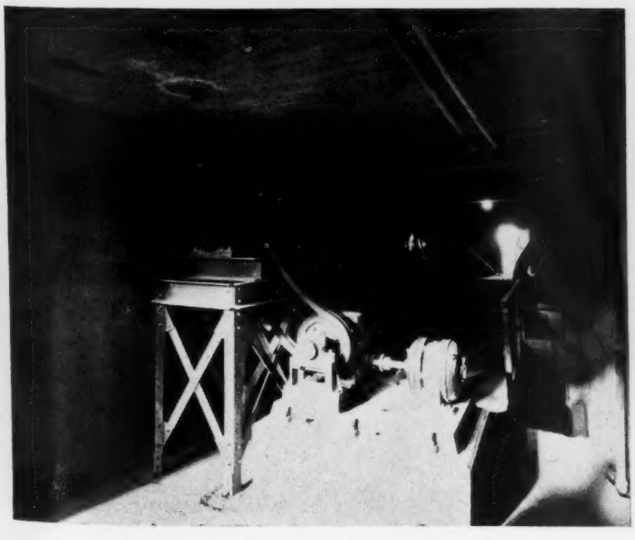


Dust collector installation in the coal house

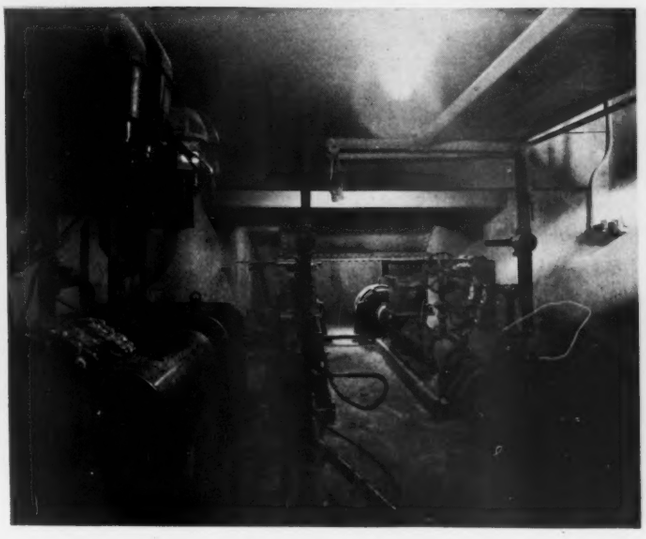
One of the two cranes used around the plant for loading and unloading cars, and miscellaneous small jobs

containing three 2500-k.v.a. transformers were built for the cement plant, and this station receives current at 33,000 v. and delivers it at 2200 and 440 v. The oil circuit breaker through which the high tension current passes is guarded on both sides by disconnect switches and is placed below the main switchboard.

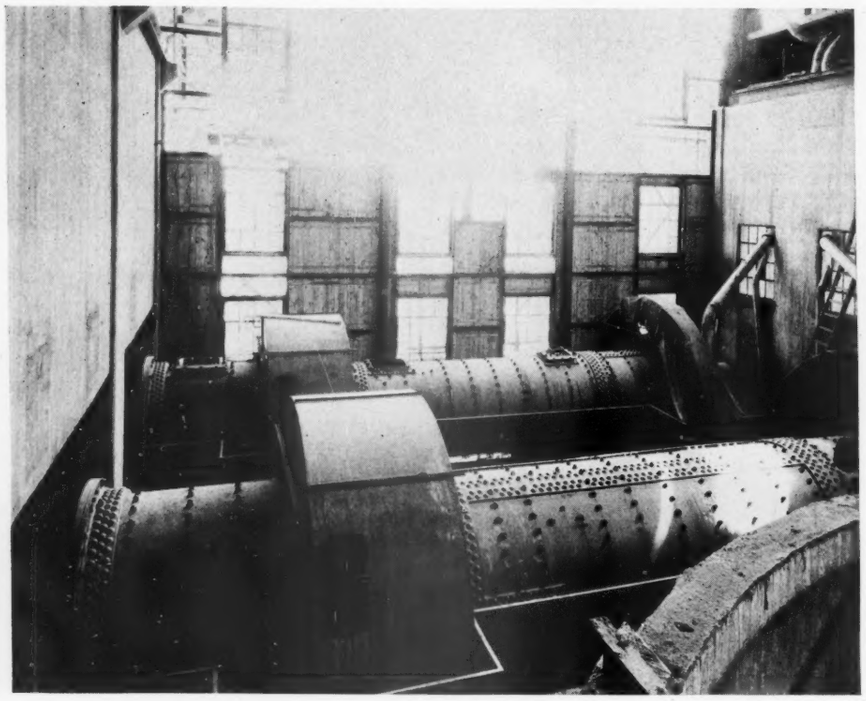
The board on the floor above has 16 panels with the following connections: 1, quarry, hoist and crusher house; 2, clay mill; 3, storage house (cranes); 4, raw-grind mills; 5, kiln room; 6, finish grind mills; 7, pack house (which has its own transformers); 8, coal mill; 9, lime plant; 10, an auxiliary panel; 11, blank panel for future use; 12 and 13, motor generator sets for exciting the synchronous motors for the air compressors; 14, a "totalizing" panel with a recording kilowatt meter, recording volt meter and a demand recorder which prints every 40 minutes; 15, an incoming line which may be connected to the public service lines for future use; 16, the generator and exciter connected to the Diesel engine. Most of these



Conveyor under the finish grinding mills, which delivers to the pumps, which send it to the storage bins



The 6-in. pump set which pumps the finished cement from the finish grind mills to silos



The pair of finish grinding mills at the new Thomaston plant

panels have only circuit breakers which control the current going to switchboards in the various plant units.

On every panel there is an overload relay and a watt-hour meter and on the top of the switchboard is a ground detector for the high voltage line that goes into the transformers.

Each of the large mill motors has its individual panel on a separate switchboard, and each panel carries an ampere meter, a power factor indicator, a time-overturn relay and an under-and-over-voltage relay with red and green lights to indicate that the current is on or off. The starting knob is also on the panel and when this is turned it starts the motor and its exciter simultaneously.

The motor has five collector rings and special windings which give it something of the characteristics of a slip-ring motor during the starting period, so that a torque 125% in excess of the running torque is developed. This is sufficient to "break out" the load in the mill as well as to overcome its inertia, and the mill begins to revolve as soon as connection is made. Automatic contactors and resistances on the lower floor control the acceleration and change the current to other windings, making the motor an ordinary synchronous motor by the time full speed has been attained. This took 50 seconds, from standing still to full speed, on the day the plant was visited, but the period may be lengthened or shortened to suit conditions. The pick-up may be watched by the ammeter needle which jumps forward as the automatic contactors throw in.

The exciters with these machines are quite small for the output, which is a maximum of 478 amps. at 45 volts. This is because they are of the type which has "frog leg" winding.

The obvious advantage of this form of motor is its simplification of starting, doing away with clutches and the like. But there is a further gain in simplifying the installation by doing away with extra buses and transformers to be used only in the starting period.

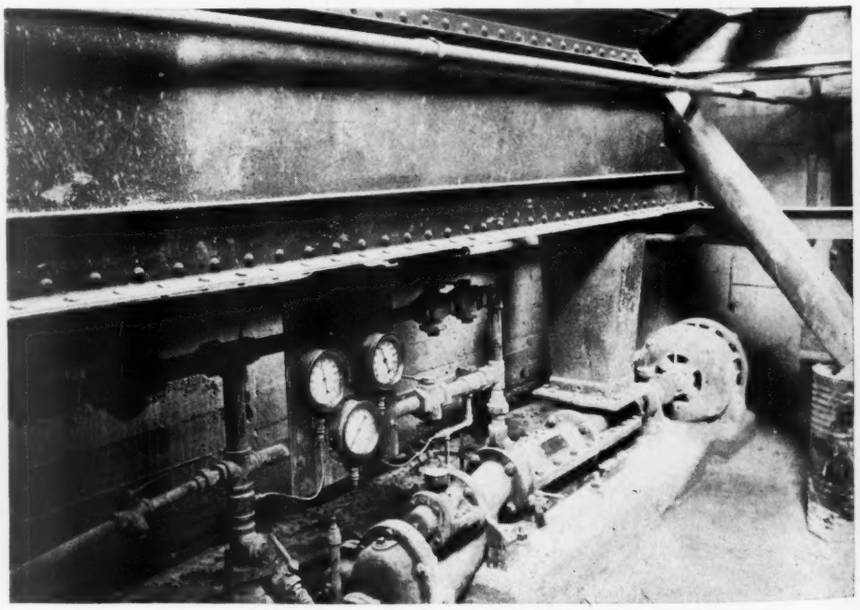
The large motors in the crusher house are of the slip-ring type on a 2200 v. current. They are manually started with a drum-drive control. The squirrel cage motors (to which type the remainder of the plant motors belong) above 50-hp. are started through Cutler-Hammer compensators. Smaller motors are thrown across the line, a number being started with "Square-D" switches. The synchronous motors of the air compressors are started by a push button, the pick-up being automatic. The exciters for these motors are of 10 amp. capacity at 125 volts.

There are no belt drives in the plant with the exception of those on the primary gyratory crusher and the clay preparation machines. All speed reducers are equipped with Timken roller bearings and Falk-Bibby flexible couplings.

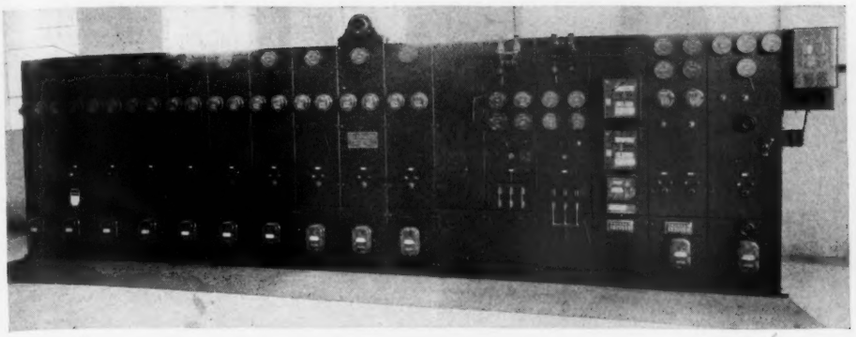
Motor Schedule

QUARRY AND CRUSHING

No. Req.	Drive	HP.	Total HP.	Speed R.P.M.
	Pumps	....	25	....
2	Well drills	15	30	....
2	Shovels	150	300	....
1	Car hoist	250	250	580
1	Gyratory crusher	200	200	580
2	Car Dumpers	15	30	....
1	Pan conveyor	15	15	870
1	Hammer mill	300	300	690
1	Inclined belt	25	25	870
1	Distributing belt	15	15	870
1	Crusher dust fan	40	40	1160
1	Crusher dust screw	5	5	1200
	MAIN STORAGE			
	Storage crane hoist (2)	75	150	850
	Trolley	15	15	850
	Bridge	75	75	850
1	Storage dust fan	10	10	1800
	CLAY PREPARATION			
1	Clay excavator			
1	Stone separator	75	75	860
1	Conveyor			
1	Storage crane hoist (2)	75	150	850
	Trolley	15	15	850
	Bridge	75	75	850
1	Wash mill	75	75	690
2	Clay Pumps	30	60	1160
1	Clay storage basin	5	5	870
2	Clay pumps to feeders	15	30	1760
2	Clay feeders	1	2	400/1200
	RAW GRINDING			
2	Wet compeb mills	800	1600	180
1	Trough agitator	5	5	870
2	Slurry pumps from mills	40	80	1160
3	Pumps, corr. & storage	40	120	1160
12	Correction tanks	25	300	600
	KILN DEPARTMENT			
1	Slurry storage agitator	10	10	870
2	Slurry pumps to kilns	40	80	1160
2	Kilns	75	150	870
2	Coolers	40	80	870
2	Blowers	40	80	1160
1	Main clinker drag	15	15	870
1	Auxiliary clinker drag	10	10	870
1	Clinker elev. fresh	15	15	870



The 4-in. pumps pumping from the kiln stock basin back to the kiln



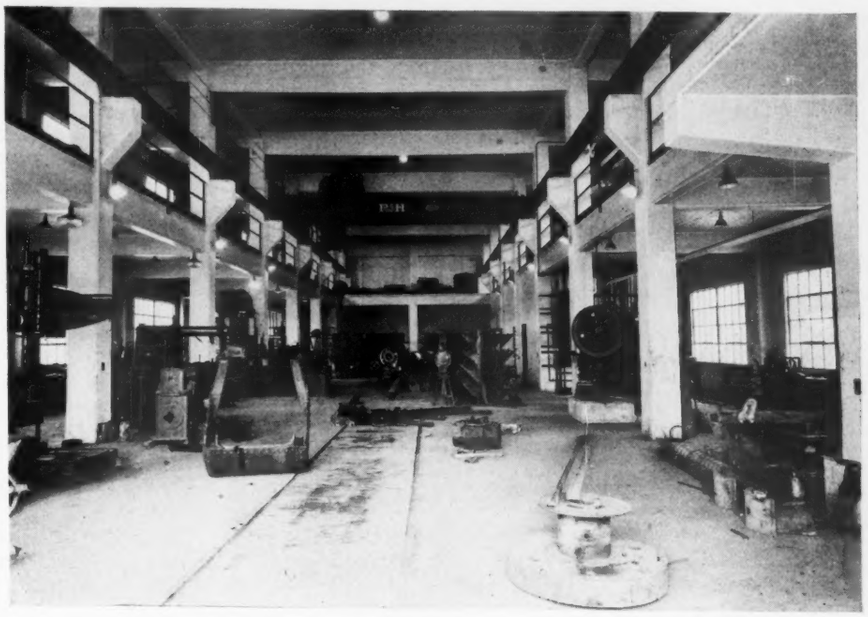
The switch board in the motor room

2	Powdered coal feeders..	1	2	400/1200
1	Stack dust conveyor.....	5	5	870
1	Fuller kiln pump.....	10	10	1200
1	Stack dust screw.....	5	5	870
	CLINKER GRINDER			
1	Poidometer, clinker	3	3	1160
1	Poidometer, gypsum	3	3	1160
1	Clinker elevator, mixed..	15	15	870
1	Drag to compeb.....	10	10	870
2	Dry compeb mills.....	800	1600	180
1	Screw after compeb.....	5	5	870
2	Fuller-Kinyon pumps	125	250	870
1	Clinker mill dust fan.....	40	40	1200
1	Clinker mill dust screw..	5	5	1200
	PACKING			
3	Main screws	50	150	870
2	Cross screws	5	10	870
2	Elevators and screens....	15	30	870
4	Bates packers	20	80	1160
2	Loading belts	5	10	870
1	Spill conveyor	10	10	870
1	Bag wheel	25	25	870
1	Freight elevator	10	10	...
1	Sewing machine	2	2	870
2	Packer dust fans.....	15	30	1200
1	Packer dust screw.....	5	5	1200
1	Bag wheel dust fan.....	20	20	1200
	GYPSUM			
1	Apron feeder	5	5	870
1	Gypsum crusher	100	100	870
1	Elevator	15	15	870
	COAL MILL			
1	Apron feeder	5	5	870
1	Coal crusher	30	30	870
1	Elevator, wet coal.....	10	10	870
1	Poidometer	3	3	1160
1	Fan for powdered coal..	5	5	3500
1	Powdered coal feeder....	1	1	400/1200
1	Coal dryer	35	35	690
1	Coal dryer dust fan.....	7½	7½	690
1	Elevator, dry coal.....	10	10	870
2	Raymond mills	75	150	450
1	Dry coal dust screw.....	5	5	870
2	Raymond mill fans.....	40	80	1160
1	Coal dryer dust coil.....	20	20	1200
1	Coal dryer dust screw....	5	5	1200
1	Coal mill dust fan.....	15	15	1200
1	Coal mill dust screw.....	5	5	1200
	GENERAL			
2	Air compressors	300	600	225
4	M. G. sets, special.....	30	120	1150
		215 kw.		1150
2	M. G. sets, general.....	60	180	1200
		50 kw.		1200

Conveying and Transmission Equipment

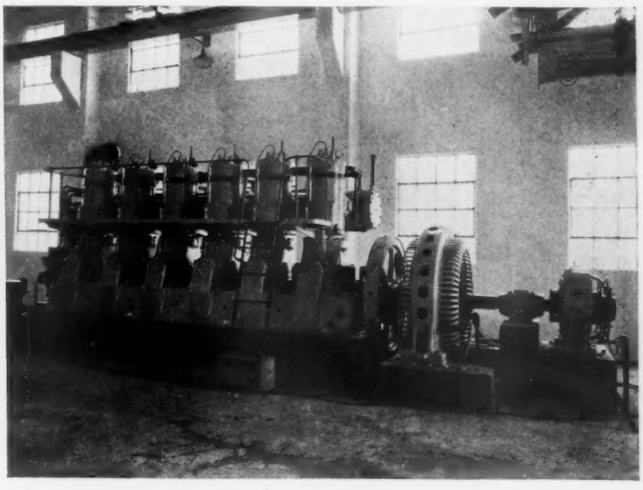
The conveying equipment, belts, elevators and the like was furnished by the Chain Belt Co., except as otherwise noted in the description given above. The transmissions are almost all of them speed reducers made by the Philadelphia Gear Works, and where slower speeds are required a further reduction is obtained by the use of chains and sprockets. All the speed reducers have Timken roller bearings, being especially ordered that way for this job. The purpose was not so much to reduce friction as to provide for the side pull of the chains, where chains were used and to have a bearing that would stand long service and be repaired by a simple replacement when this was necessary with a single standard.

Elevators and conveyors are generally run through speed reducers, but the large drags that handle clinker are driven through gears. The faces of the drags that come in contact with the clinker are faced with "Stellite" metal. Most of the elevators are of the chain and bucket type in steel casings. Two are in concrete enclosures.

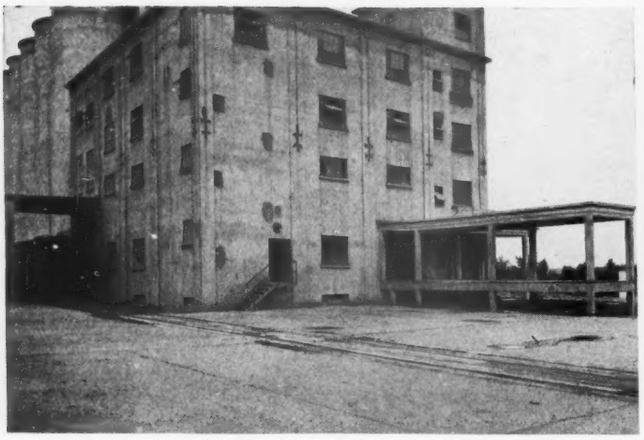


The machine shop is well equipped, with a number of different machines and a traveling crane

The two air compressors are behind the exciters in right foreground



Full-Diesel standby engine for emergency use in case of power failure



The pack house and the platforms for loading trucks and railroad cars

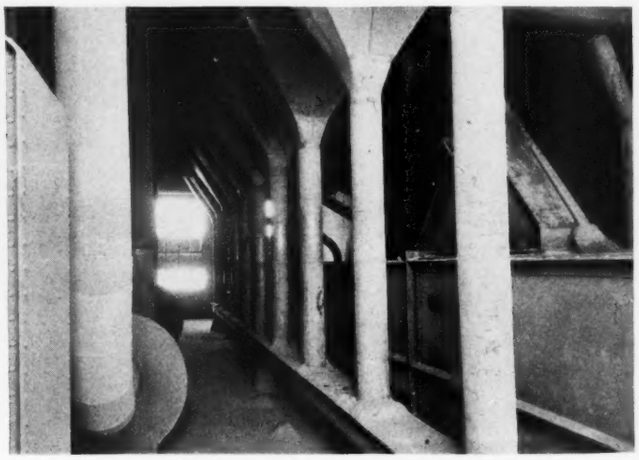
Motor and speed reducer drive running the elevator in the pack house

Construction

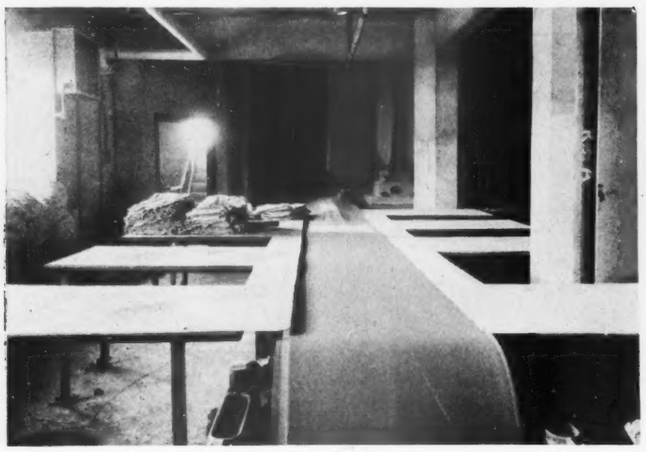
The construction methods employed are perhaps the most interesting feature of this plant. All the construction was by the Burrell Engineering and Construction Co. of Chicago, and A. C. Brunner of this company was in charge locally. But all the work was superintended by C. A. Porter, second vice-president of the Lawrence company, and C. H. Sonntag, consulting engineer, who worked out the details of the design. Mr. Porter, who has been superintendent of the Lawrence plant at Siegfried, Penn., for many years, has lived at the Thomaston plant almost from the day that ground was broken and has supervised every detail of the work.

Although the mill stands high above the surrounding country, the ground was swampy and covered with trees when the work began. Drainage had first to be provided and as soon as the trees had been cut and the brush piled and burned two ditches were dug by a Keystone excavator, each about 450 ft. long. Afterwards these ditches were made into permanent concrete tunnels about 5 ft. wide and high enough for a man

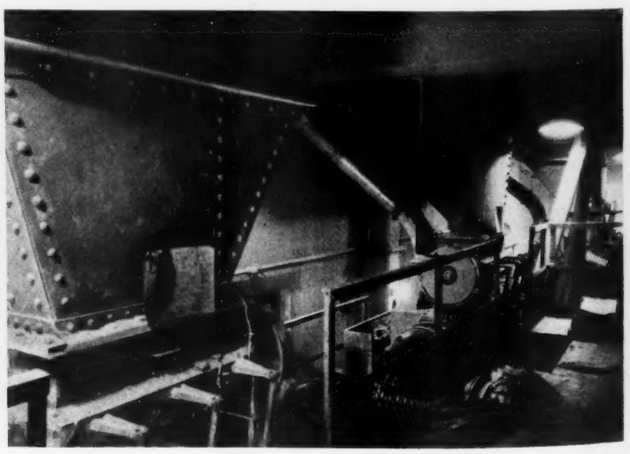
The pipes on top of the silos



Dust collector units in the pack house



Bag cleaning equipment



Bag packing machines

to walk in them comfortably. The floors of the tunnels are of boards and under the floors are half-round channels lined with concrete through which the drainage flows. These tunnels are now utilized for conduits in which the pipes for the Fuller-Kinyon pump, the water service, steam pipes for heating and electric wires are placed and they are connected to cross tunnels which have the same function.

Bed rock, as has been noted, is 12 to 30 ft. below the surface and it was a serious question whether the soil would stand the vibration of heavy machinery and the great weights that had to be carried. At one part of the site there was a slope in the bed rock which might have given rise to a lateral movement. For these reasons it was decided to support the heavy structures on legs of concrete extending to bed rock, tying them with concrete beams and a floor slab where this was required. Perhaps the hardest foundation job was for the construction of the silos, for which a number of caissons had to be sunk 22 ft. These were filled with heavily reinforced concrete and capped with a slab in which were beams of considerable depth, also strongly reinforced. The walls of the storage house, the clay storage, the kiln foundations and some of the machine foundations were all carried down to bed rock in the same way and in every case the bed rock was cleaned to insure contact with the concrete. The purpose of supporting the storage walls on concrete legs was to insure that the crane runways would not get out of alignment.

The building of silos with slip-forms is common enough and the building of some other structures of thin sections by slip-forms is becoming common. But it is quite unusual to find such walls as those of the storage building at this plant put up with slip-forms. In order to do this a new type of wall had to be designed, of cellular construction, so that thin sections of constant thickness could be used. The storage building is 388 ft. long, 100 ft. clear opening in width on the clinker storage end, and the walls are 55 ft. high. There are two partitions making a 32-ft. section near the center for the gypsum bin. The partitions are cellular as well as the outside walls.

With this construction the walls appear very massive, especially on the side toward the grinding plant, where the cells are a series of bins, 10 in all, each 20 ft. square. These hold gypsum and clinker for mixing, the mixed product, and stone and clinker for feeding the mills. They are filled by the cranes of the storage. On the other side of the storage the belt that distributes limestone is in the hollow wall.

Charles A. Porter, who supervised the construction of the Thomaston plant

The advantages of this type of construction are low cost as compared with set form work and a lessened amount of concrete for the same strength. Greater stability was secured by filling the cells with earth.

The kiln building was not built with slip forms, as the installation difficulties would have been increased by so doing. The frame is of steel and curtain walls are made of heavy wire mesh and "gunite" concrete. The power house has walls of "gunite" also.

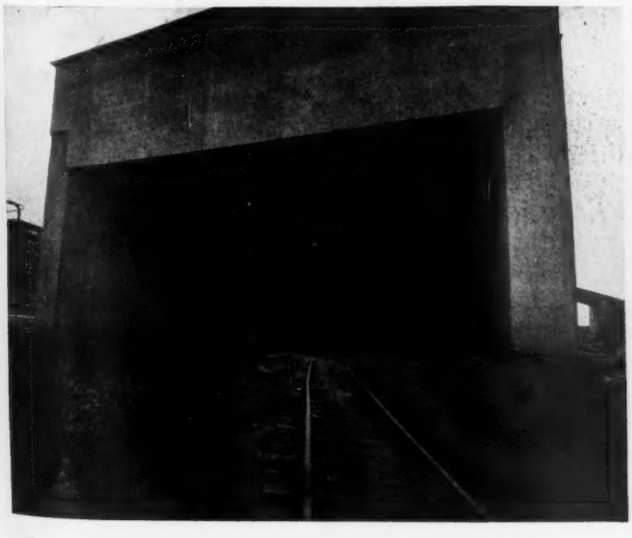
Roofs are either of reinforced concrete or concrete slabs laid on steel framing. The wide spans of roof are supported on steel trusses, for it would be quite impractical to use concrete beams. But the use of concrete has been carried just as far as it could be in all the buildings, for it was thought to be not only economy to do this but advantageous in the way of an example to other builders. The plant is an excellent example of how concrete is adapted to modern industrial structures.

Work was carried on in the coldest weather and once pouring was started on a slip-form job it went on night and day until the structure was complete. Protection to the concrete and also to the workers was had in the usual way by hanging curtains of canvas enclosing salamanders. Fortunately the winter was mild, especially at the time the larger buildings were being poured.

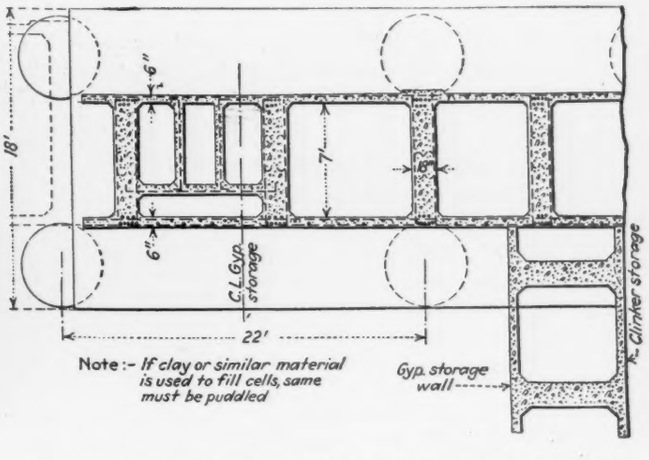
A 1:2:4 mix was used on most of the work, crushed stone from the lime quarry and some Kennebec river gravel being the coarse aggregates. The sand was all Kennebec river sand and the cement of course was of the "Dragon" brand made at the company's mill in Siegfried. It is interesting to note that the first cars that passed over the recently completed Kennebec river bridge were laden with cement for the new plant, but the bridge itself is made of imported cement. More than 50,000 bbl. of cement went into the plant structure and foundations.

Dust Collecting, Sanitation and Heating

In common with the best of modern cement mills, the new plant is practically dustless. The "Norblo" system, made by the Northern Blower Co., has been used through-



Clinker storage house showing the thick hollow wall construction



Details of the unusual, wide, hollow wall used in the clinker storage house, showing its peculiar cellular construction

out as noted. One set of collectors is placed in the crushing plant, connected to the primary crusher and the hammer mill, another set has been installed on the roof of the power house to collect the dust from the finish grinding plant, a third set of another type is installed in the pack house and a fourth set in the coal mill. Large dust collecting chambers at the foot of the stacks collect the dust from the kilns which is returned to the plant by a 4-in. Fuller-Kinyon pump.

For heating the pack house, machine shop, office building and other buildings in which employes must be comfortable in order to do their work efficiently, there has been installed a central heating plant of a modern type. The boilers, in the basement of the machine shop, are automatically fired with oil and the radiation is through Sturtevant heaters which have fans to direct the current of hot air so that the lower as well as the upper strata of air in the room are heated. A large underground oil storage has been placed near the boilers.

A change house has been provided, a fine structure situated in the heart of the plant. Each man has a set of clothes hooks and a wire basket that can be hoisted to the ceiling and locked there with a key that is in the owner's possession. Circular tubs with a center fountain allow a number of men to wash up at the same time and several shower baths with hot and cold water are provided.

Auxiliary Buildings and Equipment

The office and laboratory building stands almost at the entrance to the plant, after one has traversed the concrete road that leads from the Rockland-Thomaston highway and electric line. It contains the general offices, superintendent's office, chemical and physical laboratories and engineer's office and drafting room. The machine shop and warehouse are in a building 185x60 ft. standing near the kiln building. It is unusually well equipped so that repairs can be made to even the larger machine parts.

Equipment used for loading and unloading cars, placing machinery and like work includes two 25-ton "Brownhoist" cranes. A Plymouth 20-ton gas locomotive switches railroad cars and does similar work.

The capacity of the plant is 3000 bbl. per day and this can be increased by adding more machinery in the spaces that have been left for it at a low proportional cost.

The main office of the Lawcence Portland Cement Co. is at Siegfried, Penn. Frank H. Smith is president; Charles A. Porter is second vice-president in charge of operation; J. S. Van Middlesworth is secretary, and J. H. Van Middlesworth, purchasing agent. The Thomaston plant superintendent is E. J. Davis; H. M. Hess is chemist. Thomaston is the post office of the Maine plant.

General view of the Thomaston plant

Nature and Uses of Fluorspar

FLUORSPAR, or fluorite, is a nonmetallic crystalline mineral that usually occurs in glassy, transparent isometric crystals, largely cubic, or in cleavable masses. Less commonly it has a granular or fibrous structure, and occasionally it is banded. Fluorspar has a specific gravity of 3.2, is brittle, has a hardness of 4, and can easily be scratched with a knife. Fluospar is a mineral of many colors, ranging from clear, colorless or slightly bluish, and glasslike, through various striking hues, of which purple and green are most common; much of it is white and opaque. Chemically it consists of calcium and fluorine in the proportion of 51.1 to 48.9.

Fluorspar has many uses, but its most important use is in the manufacture of steel by the basic open-hearth process, says the United States Bureau of Mines, in the statistical report on production of fluorspar and cryolite in 1927. It is also used in the manufacture of alloy steel and ferro-alloys by the electric-furnace process, and in some foundry and other metallurgical operations.

Fluorspar is used in considerable quantities in the glass industry, chiefly for the manufacture of opal or opaque and colored glass; as an ingredient in enamels for various purposes; and in the manufacture of cement, in which it is said that the addition of fluorspar to the raw materials permits the lowering of the fusing point, resulting in considerable economy in fuel, as well as an economy in power, because the clinker obtained is fragile and therefore more easily ground.

Fluorspar is the basic material used in the manufacture of hydrofluoric acid and for the less well known hydrofluosilicic acid that is prepared by leaching silica with hydrofluoric acid prepared from flourspar. This acid is the electrolyte used in the electrolytic refining of lead by the Betts process. This process produces the purer grades of lead for corroding or other purposes. It is also said to be used to facilitate the fusion and contact of ingredients in the manufacture of calcium carbide and cyanamid.

A very small quantity of clear fluorspar crystals is used for optical purposes; fluorspar is useful in correcting the color and spherical aberration errors in lenses, especially for microscopes and small telescopes.

Copies of the Bureau of Mines statistical report on "Fluorspar and Cryolite in 1927," by Hubert W. Davis, may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at a price of 5 cents.

World-Wide Traffic in Diatomaceous Earth

THE WORLD'S LARGEST and most highly developed deposits of diatomite, a porous mineral, are located in California, the minerals division, Department of Commerce, stated October 13. The statement follows in full text.

Diatomite output of the United States in 1926 totaled 79,030 metric tons. Algeria, which supplies the greater part of the European demand, was the second largest producer, with 7,931 tons exported; Germany was third, with 5,919 tons exported.

Diatomite deposits of commercial size occur in most of the European countries. Kenya, East Africa, contains very extensive deposits, but distance from markets renders these of no present value. At several other places in Africa, Oceania, North and South America, there are numerous deposits varying in size and present commercial importance.

Diatomite has many industrial uses, based mainly upon its properties of porosity and its chemical inertness. These include use as an insulator against heat and sound, a filter aid and filtering medium, a filler in rubber and cement, and inert base for the manufacture of dynamite, and an abrasive. The physical characteristics of the material place certain limitations upon its commerce; as it is a very light and porous product, it takes a rather high freight rate and does not make a particularly desirable ocean cargo. As a result many deposits are largely limited in development to the needs of adjacent territory, although the higher grades enter into foreign trade under favorable conditions.

By virtue of its mode of formation, diatomite is one of the most widely distributed of minerals. It is composed widely of fossil remains of microscopic marine plants known as "diatoms," which flourish abundantly in both salt and fresh water. The siliceous skeletons are deposited in beds, and found at many places where bodies of water formerly existed; the process of formation is continuous, but the Tertiary period appears to have been the most favorable for the growth and deposition of these plants, and during this period most of the deposits formed.

Peerless White Lime Company

A Lime Plant with Chemical Control

By Ralph W. Smith
Mine Superintendent and Director of Research, Peerless White Lime Co., Ste. Genevieve, Mo.

THE PEERLESS WHITE LIME CO.'S plant (a subsidiary of Hunkins-Willis Lime and Cement Co., St. Louis, Mo.) at Ste. Genevieve, Mo., should be of double interest to those interested in lime burning, because it typifies that progressive spirit of research and technical improvement which has been awakened in the lime industry in recent years, and because it is doing important pioneer work in specialized chemical control of lime burning and its various products. The need of more definite, daily chemical knowledge concerning the operations of lime burning has been felt for some years and has been dwelt upon in some detail at lime conventions. There is quite a difference, however, between acknowledging that research and improvement is desirable, and making the necessary expenditures of time and money to enter the research field actively. The Peerless White Lime Co. definitely committed itself to such a program and is making important progress, not only in scientific control of lime and hydrate manufacture, but in improving other phases of operation, and developing new products.

Starting with two shaft kilns in 1908, the operation expanded until there are now ten vertical shaft kilns, including two large production kilns erected in 1926. Rock is broken by hand in the mine (as described in ROCK PRODUCTS, May 12, 1928) and hauled to a three-compartment concrete bin by gasoline locomotives in trains of four to ten cars. The major part of haulage equipment is Koppel steel side-dump cars, although there are a number of steel, bottom-dump cars (such as are used in coal mines) and removable-box cars in service for special purposes.

The concrete, rock-storage bins were built in 1927 and are an important item in improving the transportation efficiency and furnishing night and holiday storage for the kilns. The combined storage capacity is about 1000 tons, which is often increased an additional 200 tons by side-tracking loaded cars. The removable-box cars are used for supplying a special chemical stone to one kiln, and the rock from these cars is hoisted into the kiln direct from the track without going into the storage bin.

Gas Firing an Early Improvement

In the early days the kilns were direct-fired, but experiments were soon started to develop individual gas producers. After considerable experimenting and alteration, successful individual producers were developed, some of which are yet in operation after 15 years. Of recent years, all lime has been burned with gas and, under full production in 1925, sixteen of these small producers were in operation during peak production, when eight kilns were on lime. This called for considerable duplication of hand labor and exerted an important influence in the design of the new plant addition, which was started early in 1926.

In order to centralize operations, a Woods heavy duty automatic gas producer was included in the design of the new plant and has been in successful operation since the summer of 1926. The installation of this unit might be compared to replacing 16 small, old-fashioned electric generating plants in an industrial area with a single central generating plant, modern in design and efficiency. At the Peerless plant this change has resulted in fewer labor hours per ton of lime produced, a better fuel ratio, better control of kilns and better quality of lime.

The large kiln designated as No. 9 at the Peerless plant, showing the head frame for the skip hoist and also the closed top. The coal track, elevator and coal bin are at the right

Of course, there are some disadvantages to the plant. It is not so flexible as the individual units. In case of a major breakdown at the producer the entire plant must be shut down, unless special provision has been made to continue production. It has been comparatively easy to provide for this at the Peerless plant, as the old individual producers were not removed, but can be fired up and cut into the kilns on a few hours' notice. However, breakdowns are not so liable to occur after a year or so of operation, as breakdowns are usually caused by inexperienced operators and lack of knowledge of proper operating conditions. After a producer has been running for a year or more, those responsible for it are much more competent and can usually avoid the things which cause breakdowns. Among other things, the operators of an automatic producer must find out the most suitable fuel, its proper size, the proper depth of fuel bed and ash bed, pressure of blowing air, amount of steam in blowing air, and gas pressure in the gas main.

At present the automatic producer furnishes gas for 70% of the peak capacity of the Peerless plant, and since the plant does not run continuously at peak capacity there is usually not more than one or two kilns on individual producers.

Fuel Handling and Flue Cleaning

Labor for coal handling for the large producer is practically nil. Gondola railroad cars are spotted on a concrete and steel trestle directly over a concrete hopper, which feeds into a pan conveyor. This conveyor dumps into a bucket elevator which feeds a 100-ton storage bin directly over the automatic feeder to the gas producer. The gas producer operator draws coal from the hopper as he needs to replenish the bin. Gas from the producer passes through a soot collector and then into a 51-in. gas flue, 250 ft. long, from which various outlets are made to the kilns. The gas flue contains a 2½-in. lining of heat-insulating brick next to the iron shell and a 5-in. layer of fire brick inside of the insulation. A considerable amount of sensible heat exists in the gas as it comes from the producer (at 1200 deg. F.) and it is important to deliver as much of this as possible to the kilns.

An early source of annoyance and delay was the weekly flue blowing necessary to keep the gas main and take-offs open for the free passage of low-pressure gas. A helpful device was developed which greatly reduced the loss of time from this operation. It is a mechanical flue blower using compressed air, which is injected the full length of the gas main by means of a small gear and cable connected steam engine.

A very important link in securing a satisfactory fuel ratio is the proper design of burner and combustion chamber. Considerable changing and experimenting was necessary at the Peerless plant before a satisfactory burner was developed, but those now in use are giving excellent results. Secondary blowing air at low pressure is introduced to the combustion chambers through a specially constructed, quick-opening valve, which has an injector effect on the producer gas and at the same times mixes and helps carry the flame along the combustion chamber and into the kiln.

The coal track, concrete hopper and rock track for the new plant and the No. 9 kiln

Chemical Control in Operation

A helpful phase of chemical control is illustrated at this point by its assistance in developing satisfactory burners and proper combustion by means of numerous gas analyses during the experimental stage and periodic gas analyses of various products during regular operation. Analyses are made at regular intervals of exhaust gas from kilns and gas producer gas, and at other times gas at various elevations in the kilns is analyzed. These analyses are usually for CO_2, CO and O, with occasionally a hydrogen determination. Kiln temperature readings are also taken at various time intervals. This combustion research is under the direction of Victor J. Azbe, consulting engineer, St. Louis, who is well-known in this field.

In considering the adaptation of centralized gas production to a battery of lime kilns at the Peerless plant, it is interesting to note the following objection to gas burning voiced at a Lime Association meeting in 1911, in discussing a paper on the subject:

"Chemistry is all right for college professors, but let me tell you the quickest way to ruin business is to start experimenting on it. I know a man outside of St. Louis who went broke because he did not take the advice of his old foreman, but listened to these chemists who said they could burn lime with gas. Now everybody knows you can't burn lime except with wood." (Quoted in Rock Products, April 30, 1927, p. 44.)

Successful Operation of Large Capacity Kilns

About the time it was proposed to centralize the gas production at the Peerless plant it was also found desirable to increase the production capacity, and so the equipment to satisfy the two needs was incorporated in a new unit plant adjoining the existing one. Foundations, rock storage bins, shed and shells for two large-production kilns were erected, and the gas producer placed in a central location between the two new kilns.

From here a gas main extends to the smaller kilns. Thus the producer is close to the largest demand for gas, thereby reducing heat loss and pressure drop. Realizing that there was much virgin territory to be explored with the large-production kilns, only one was completed for lime burning when the plant was originally built. During the past two years many changes have been made in this kiln (designated as No. 9), both externally in the gas burners, and internally in the combustion chambers, burning eyes, punching eyes, lining, lime cooler and rock storage zone. This has all been productive work, however, with each change bringing either added efficiency or higher production, until in the past six months it is felt that the kiln has approximated near enough to its possibilities to justify the completion of the other kiln. During the experimental period on the No. 9 kiln the production has increased 100%, the fuel ratio has shown a marked improvement, the life of kiln lining has been greatly increased, shutdowns and hard manual labor on punching have been greatly reduced, and the quality and color of lime was considerably improved.

The shell of No. 9 kiln is 16 ft. in diameter and 84 ft. high from the drawing floor. Above this extends an automatic closing top 22 ft. high, and a steel support for sheave wheel for skip hoist. Rock is delivered from the 150-ton, concrete storage bin located over the loading pocket, by gravity over the 45-deg. inclined bin bottom, through an air-operated, chute arc-gate into a 5-ton capacity skip nominally carrying a load of 4 tons.

The kiln is drawn every four hours and is filled after every draw, day and night. The kiln holds approximately 250 tons of rock. There are two decks of burning eyes into

the burning zone, a total of eight eyes for the kiln, four on each side. Below this is a lime storage or cooling zone which holds about 20 tons. Lime as drawn from the kiln is cool enough to load direct in cars or handle otherwise, but is usually spread out on the lime-shed floor for inspection and selection into various grades for direct shipment, or for hydration. The average daily output of the kiln in recent months is 60 tons of burned lime. Low-suction, induced draft is furnished the No. 9 kiln by a Sturtevant fan located on the firing floor, driven by an induction motor and connected with the kiln top by a 42-in. suction pipe. The No. 9 kiln was designed by D. S. Hunkins, the vice-president of Hunkins-Willis Lime and Cement Co., in collaboration with Victor J. Azbe, consulting engineer, St. Louis, who is a well-known contributor to these columns. The erection of this kiln and part of the new plant was supervised in part by the writer; and most of the operation, experimentation and improvement in performance was secured under the plant managership of the general superintendent, F. O. Withrow, in collaboration with Messrs. Hunkins and Azbe, with the occasional assistance of the writer.

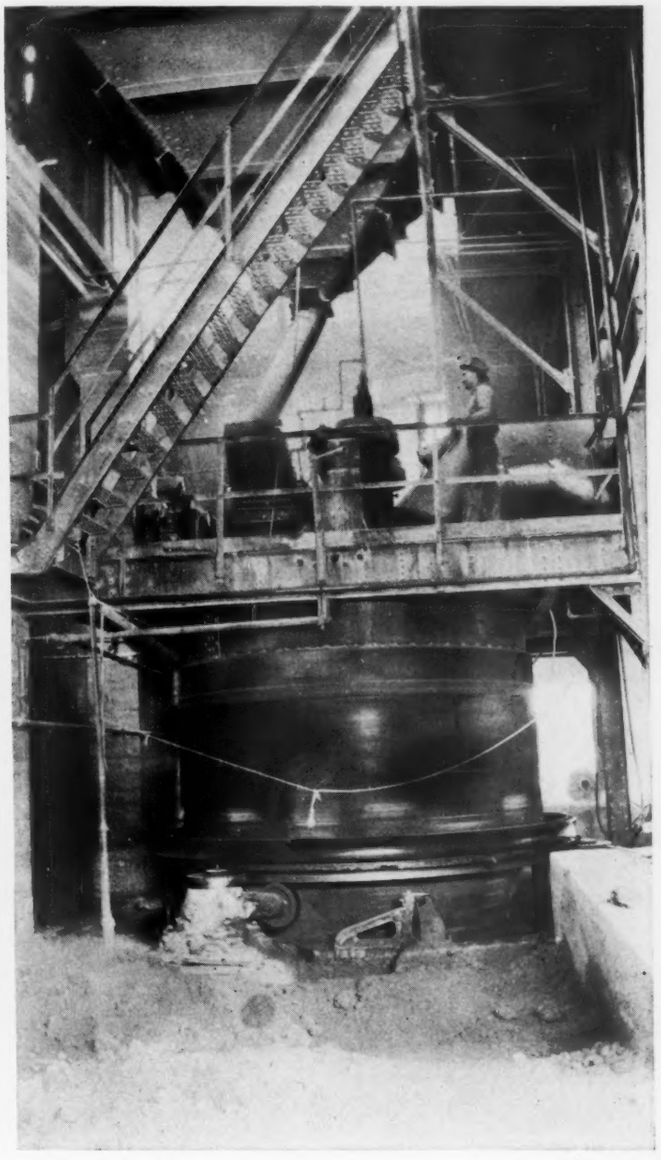
Raising the Capacity of the Smaller Kilns

After the operating wrinkles had been ironed out of the No. 9 kiln, and its performance had approached the expectation of its designers, it was decided to apply some of its principles to the smaller kilns, and accordingly exhaust fans have been added to several of the smaller kilns, which operate in conjunction with an automatic-closing, insulated, steel top designed by the writer. The addition of this equipment to the smaller kilns has resulted in a marked increase in production, better balance in the kiln, easier control, less manual labor, longer life of kiln lining, and a better quality lime. These kilns are filled after every draw and this helps maintain the uniform conditions which are so desirable in lime burning. A helpful instrument for maintaining this uniformity in the induced-draft kilns is a draft gage, and the top of each induced-draft kiln is connected to such a gage, located at a convenient spot on the firing floor.

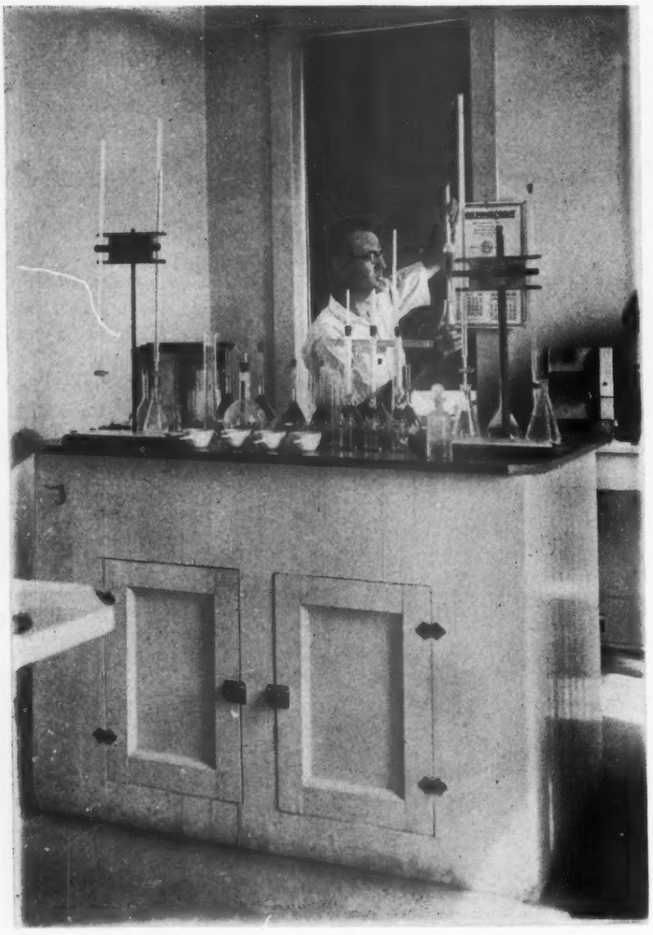
As a general rule, the "sticking" method of firing and drawing is practiced at the Peerless plant. This enables the firemen to trim the kilns to better advantage, prevents adherance of lime to the kiln lining, with consequent slagging, prolongs the life of the linings, enables the firemen to know the actual condition of the lime over the entire cross-section of the kiln at the important burning zone, and reduces the amount of unburned rock due to "rolls" during the draw.

From the lime-shed floor, various grades of lime are sorted for shipment in bulk or

The extension of the mine rock track above the concrete special lime shed



The automatic gas producer showing the coal bin, spout and feeder above



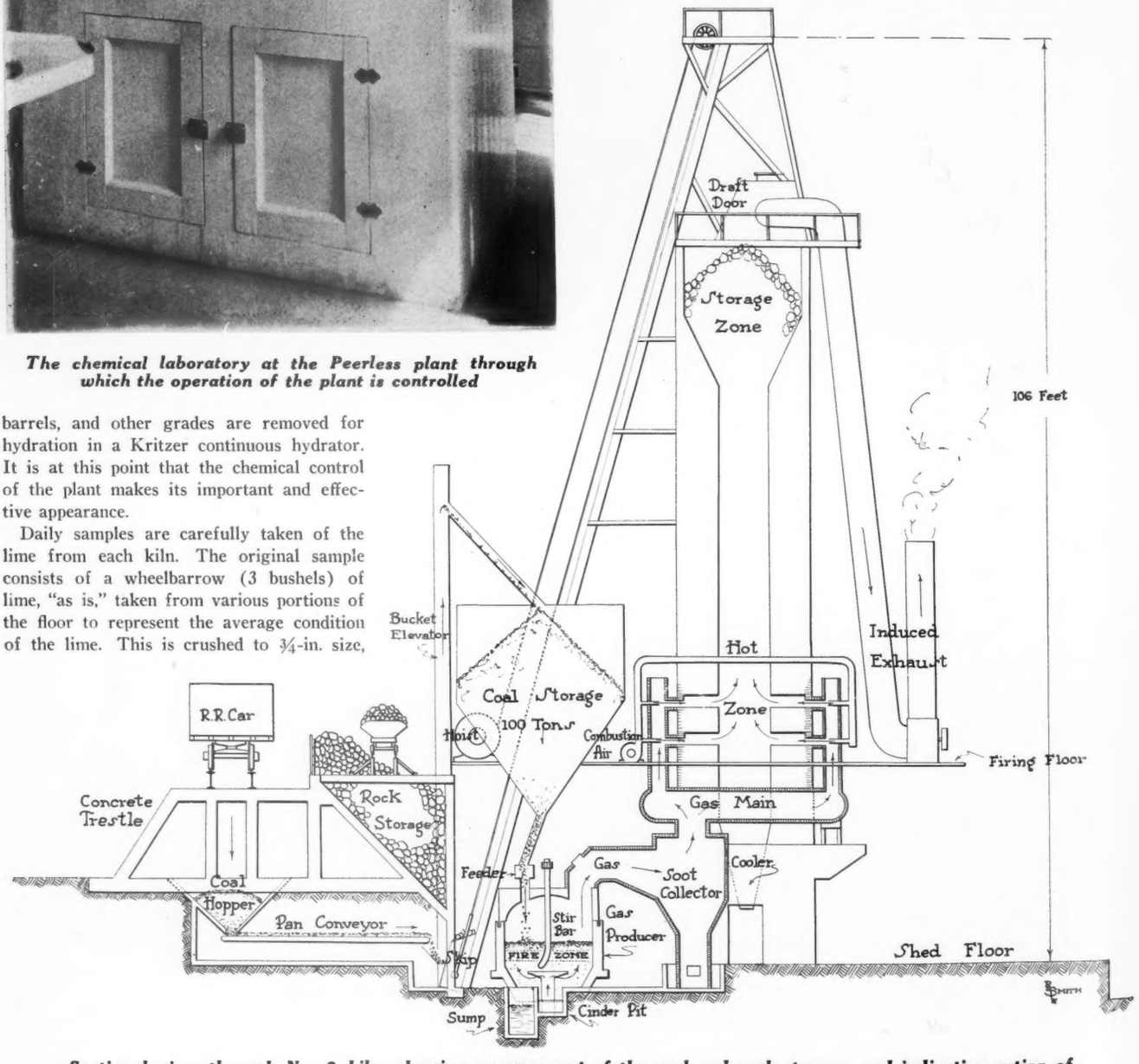
The chemical laboratory at the Peerless plant through which the operation of the plant is controlled

barrels, and other grades are removed for hydration in a Kritzer continuous hydrator. It is at this point that the chemical control of the plant makes its important and effective appearance.

Daily samples are carefully taken of the lime from each kiln. The original sample consists of a wheelbarrow (3 bushels) of lime, "as is," taken from various portions of the floor to represent the average condition of the lime. This is crushed to ¾-in. size, quartered, crushed again to about ¼-in., and split to laboratory size in a riffle sampler. Further reduction in size and fineness of sample is made on a bucking board in the laboratory to minus 100-mesh, and the sample is then analyzed for CaO. Occasionally other determinations and 100% analyses are made on these samples. In addition to these daily determinations, all shipments of hydrate, whether carload or less, are analyzed for $Ca(OH)_2$, and some cars of lime are analyzed for CaO. In the case of hydrate, in order to secure a composite carload sample, a pipe sampler is inserted into every twelfth sack as it is loaded in the freight car.

Laboratory Carries Out Routine and Special Analyses

Thus the plant office usually has the analyses of each shipment before it leaves the plant and knows whether it is of the proper quality. The kiln analyses and carload analyses are received in the St. Louis office with the car numbers within 12 hours after the shipments leave the Peerless plant. The above analyses constitute the routine work of the laboratory, but this is supplemented by a large and constant volume of research and special analyses. Among the special analyses and control work are arsenic determinations



Sectional view through No. 9 kiln, showing arrangement of the coal and rock storage, and indicating action of gas and air in the kiln

in tenths of a part per million, silica, magnesium, iron and alumina, sulphur and calcium carbonate determinations.

Research to Eliminate Arsenic and Sulphur

Considerable helpful research has been done in arsenic and sulphur causation, on causticity and special hydrator and lime tests for the production foreman. A number of new products have been developed, such as exterior and interior cold water paints and waterproof cement paint. Frequent screen and chemical analyses are made on the varied list of pulverized products developed several years ago and now in production at the pulverized limestone plant.

In addition to this research and lime control work, daily analyses are made of boiler feed water and boiler water after the lime-soda ash treatment in the chemical water softener recently developed and installed at the plant.

Plant Makes Its Own Power

In the past year the Peerless plant enlarged its power plant by the installation of two Chuse uniflow steam engines, direct-connected, respectively, to 250-k.v.a. and 375-k.v.a., 2200-v. generators; and the plant is now independent of purchased power except during emergencies such as a breakdown or boiler cleaning. The main steam load is carried by a Sterling boiler, which develops 400 hp., while a twin, return fire-tube boiler is used at times as an auxiliary. At present the power house is generating about 300 kw. of electrical energy in addition to the steam supply for the kilns (large and small gas producers), and several steam hoists for operation of the kilns and crushing plant.

Importance of Laboratory Control

The important position of the laboratory as a control factor at the Peerless plant is easily recognized from the foregoing description. It is quickly consulted in case of trouble of any kind. If a drop in per cent. of CaO is noted in one of the kilns it is corrected before it becomes serious enough to cause customer complaints. The kiln foreman watches the daily analysis sheets very closely and finds them of considerable assistance in maintaining the uniformly high-quality product demanded by Peerless specifications. In the case of special products, the laboratory has been able to develop a number of interesting and effective control factors which insure the uniformity which is sometimes difficult to maintain. The laboratory work is carried on in the recently constructed office building of cinder block and lime stucco, which also contains the plant office and the engineering office of the company.

New cinder block and lime stucco office building at the Peerless plant, containing the chemical laboratory and engineering office

Tensile Strength of Mortar in Brickwork

A SERIES OF TESTS of the adhesion of mortar to sand-lime brick by the U. S. Bureau of Standards has furnished an opportunity for comparing the tensile strength of the mortar in the brick with the strength of the same mortar in the form of standard briquettes. The results herein reported were obtained with a 1:1:6 cement-lime mortar, in which various amounts of diatomaceous earth had been substituted for equal amounts of lime. The mortars were mixed to a consistency which gave a ½-in. slump in a 2- by 4-in. cylinder. From each batch of mortar 6 standard tensile briquettes were cast and 10 pairs of brick joined together.

The bricks and briquettes were aged together in the air of the laboratory for 28 days, after which the tensile strength of the mortar and the adhesion of the mortar to the brick were determined. The mortar was then removed from the brick to which it adhered, separating readily in slabs about 0.45 in. in thickness. The slabs were cut into specimens about 3 by 1½ in., care being taken to obtain specimens both from the interior and the edge of the slab.

Saw cuts ¼-in deep were made at the mid-point on each side of the specimens cut from the interior of the slabs, to form a reduced section 1-in. across for the tensile tests. With the specimens cut from the edge of the slab a single cut only was made from the side opposite the exposed edge, so that this edge might be included in the reduced section being tested.

Strips of light wood placed over two layers of blotting paper were clamped to each end of the specimen. These formed grips by means of which the upper end of the specimen could be attached to a support and a container for shot attached to the lower end. Shot was poured slowly into the container until the specimen failed. Calculations were then made to determine the tensile strength.

In the table, tensile strengths are the average of the number of tests given in the briquets, where the figures in all cases were the average of six tests.

It will be noted that in 10 of the 11 mixes tested, the specimens from the edge of the mortar as it lay in the joint were stronger than those obtained from the interior portion of the joint. Also, in 8 of the 11 mixes the mortar specimens, both from the edge and the interior, were stronger than the same mortar in briquet form. There are several factors which may affect the stength of the mortar in masonry, so that its strength is not necessarily related to that in briquet form. Tapping and jarring as the brick are laid, pointing up the edges, and the absorption of the brick all tend to produce a denser mortar. The interior of mortar in brickwork may be kept in a damp condition

TENSILE STRENGTH OF MORTAR IN BRICK

Diatomaceous earth substituted for lime, %	Specimens: From edge, No. of specimens tested	From edge, Tensile strength (average) Lb./in.²	From interior, No. of specimens tested	From interior, Tensile strength (average) Lb./in.²	Tensile strength of mortar in briquets (average of 6 tests Lb./in.²
0	6	41	3	45	53
10	8	53	5	46	59
20	7	69	5	61	51
30	8	56	5	34	53
40	9	75	8	65	59
50	9	73	7	53	43
60	6	82	13	58	54
70	14	70	10	52	40
80	14	80	10	69	41
90	15	73	9	67	27
100	15	65	10	52	36

longer than the mortar in briquet form, thus tending to increase the strength of a cement mortar. The surface exposure is relatively less in the masonry joint than in the briquet, and consequently carbonation from the air is less. In the particular mortars tested the factors tending to increase the strength were apparently more defective than the others. Whether this would be true of all mortars can not be predicted from the available data.

Geological Bulletin on Pennsylvania Coals

THE Pennsylvania Topographic and Geologic Survey, under the direction of Geo. H. Ashley, state geologist, and in co-operation with the Department of Forestry and Water, of which C. E. Dorworth is secretary, have issued a bulletin on "Bituminous Coal Fields of Pennsylvania," numbered in the fourth series, bulletin No. M-6, 1928. This book is an introductory volume and provides a general discussion on coal. Macroscopic and microscopic physical characteristics, chemical properties, origin, classification, and classes of coal, and the geology and description of the beds that go to make up the various groups of Pennsylvania coal are dealt with in separate chapters. The bulletin of 241 pages can be secured for 50 cents.

Otay Rock and Sand Plant of the Spreckels Commercial Company

By George Adams Roalfe
Consulting Engineer, Long Beach, Calif.

THIS article will treat briefly of the plant constructed at the Otay deposits for the Spreckels Commercial Co., at San Diego, Calif. This unit is only one of several operating properties owned by the company. It is believed that the plant has a number of novel features, in general not encountered in rock and sand plants; and it was the purpose of all concerned to eliminate as many of the mistakes usually made, as possible, and to incorporate all the best features developed to date.

The Otay deposit controlled by the company is approximately 7 miles long and varies from 200 to 1200 ft. in width. The original estimate of gravel reserve approximates 10,000,000 tons, and the experience obtained during the first year of operation indicates that this estimate is very conservative. The character of both rock and sand is extremely good; the rock is a hard porphyry, and the sand is almost entirely free from mica. This characteristic of the sand has created a very heavy demand for it in this market. All rock occurs in varying sizes from pea gravel up to 20-in. boulders.

Three General Objectives in Design

In the design of the plant three general objectives were kept in mind: First, to locate all mechanical units so that they could be carried on foundations built on the ground, for this plan tends toward economical construction, as well as accessibility during operation and repair; second, a straight-line, flow sheet, which is the ideal to be striven for in any industrial plant; and, third, the adaptability of the design for future extensions.

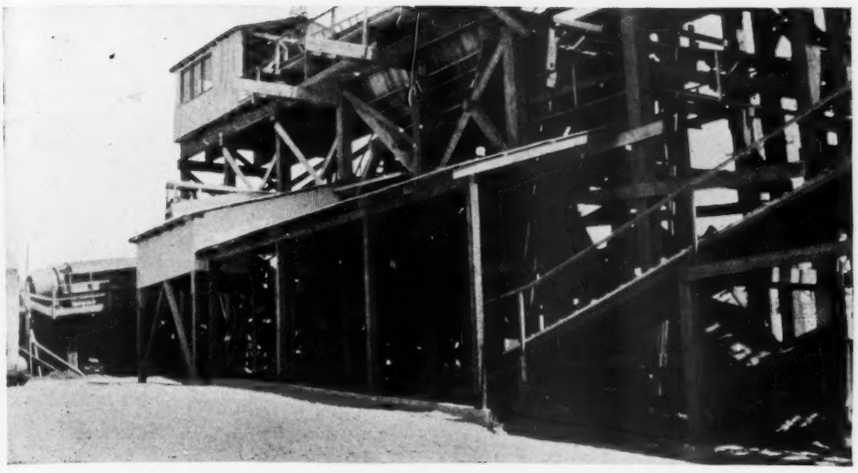
The receiving hopper and the gyratory crusher added to the equipment at the Spreckels plant to break the larger boulders

The first condition was met with one exception, that of the sizing screen, which was located on top of a tower construction approximately 50 ft. above the ground. The second condition was strictly adhered to, and reference to the diagrammatic flow sheet shown herewith will readily indicate this. The third condition has already proved to be true, for the 20-in. McCully gyratory crusher was not installed in the initial construction, as it was believed wise to investigate the deposit under actual operating conditions to determine if the percentage of the rock contained was sufficiently large to require this unit. The operation of the plant for the first three months was such that a very small percentage of oversize material was encountered, but since that time increasing percentages of boulders 12 in. and larger have been found, and in January, 1928, this crusher unit was installed. This installation did not require any changes in the existing units, and only called for the crusher and its incidental belts.

The separation screen and the duplex rake sand washer, with the conveyor to the rock plant in the rear

Flow Sheet

The following description of the process, and reference to the diagrammatic flow sheet, will enable the reader to gain a comprehensive idea of the operation. Material is dug from the deposits with a Northwest crane fitted with a 1¼-cu. yd., drag-line bucket, and loaded into 5-cu. yd. dump cars. These cars are then moved by means of an 8-ton Plymouth locomotive to the foot of an incline in 4-car trains. The trackage arrangement at the foot of the incline is such that the loaded cars are pulled up from one track and the empties let down on a second track. The cable hoist has a capacity for two 5-cu.



The hoist house and holding hopper above the scalping screen and secondary crushers, with the separation screen at the left and the return belt to the primary crusher at the right

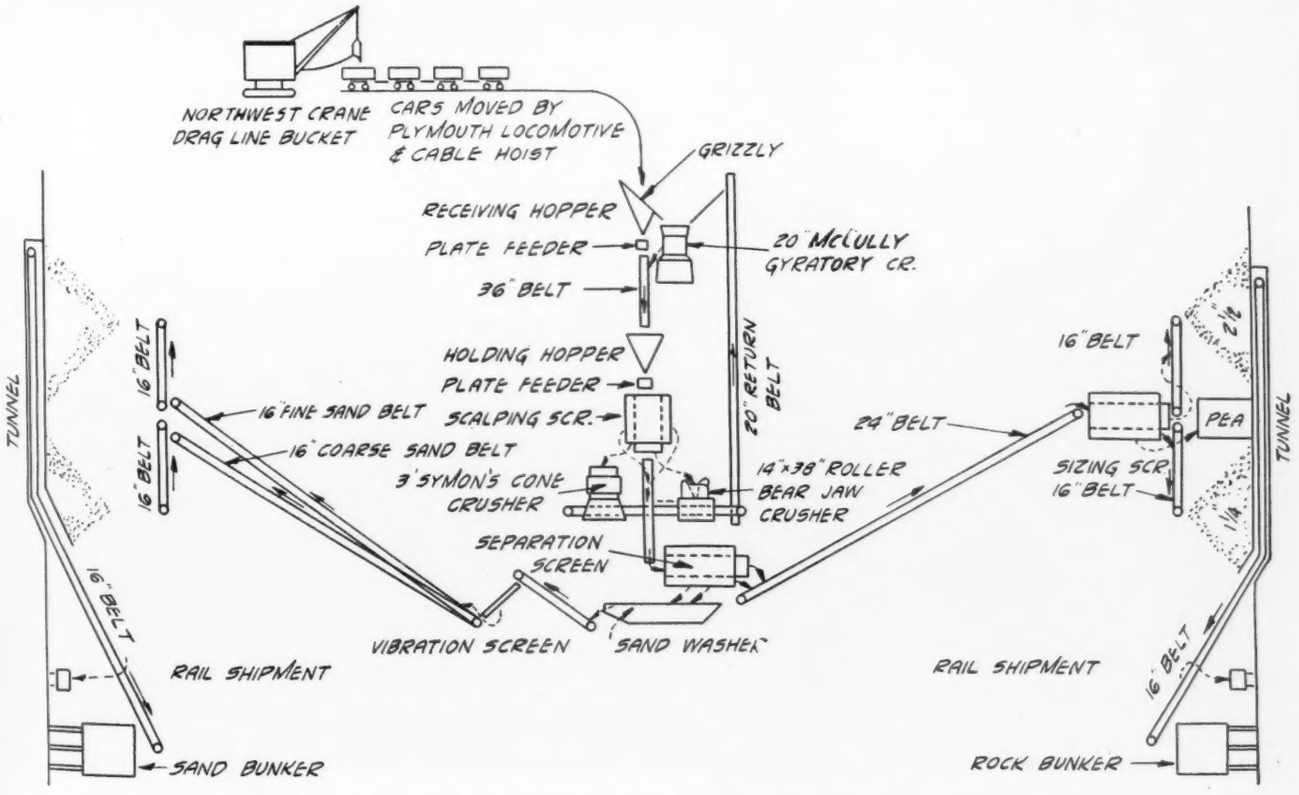
yd. cars at a time, and the operation as timed makes possible the continued movement of the locomotive crane as well as the hoist.

The cars are pulled up the incline to a receiving hopper fitted with a grizzly with 5-in. spacings. Material under 5 in. passes down through the grizzly into a storage bin, and is fed out by means of a plate feeder to a 36-in. belt conveyor. The rejects of the grizzly are fed into the 20-in. McCully gyratory crusher; and its product in turn is fed back to the 36-in. conveyor belt mentioned above. The method of loading the 36-in. conveyor belt is such that the sand and finer material is loaded first with crushed material from the gyratory crusher on top, greatly reducing the wear on the belt. The 36-in. conveyor belt carries the mixed material up into a holding hopper having a capacity of 75 tons. From this holding hopper the material is fed by means of a plate feeder into a double-jacketed scalping screen. Material passing the outer jacket contains material under 2½ in. in size, and is carried directly into the other units of the plant. Material passing the inside jacket and rejected by the outside jacket is fed by gravity into a 3-ft. Symons cone crusher. The material rejected by the inside jacket is fed by gravity into a 14 x 38 - in. "Roller Bear" jaw crusher (equipped with roller bearings) by gravity.

The product of these last two named crushers is conveyed by two belts to the gyratory crusher, thereby closing a circuit of the crushing units. It is evident that by the proper setting of the second and third stages, the percentages of various sizes of rock passing into the plant may be conveniently regulated. The material passing through the outside jacket of the scalping screen is conveyed on a belt conveyor to a double-jacketed, separation screen. At this point the rock and sand operations are separated. The separation screen was provided with two jackets to relieve the outer jacket from excessive loads and aid in a more perfect separation of the sand from the rock. Considerable water is used at this stage, serving the dual purpose of washing the rock and aiding in washing the sand through the screen into a duplex, rake washer below.

Rock Part of Plant

We will now treat the rock division of the plant. Reference to the diagrammatic flow sheet will show that the product passing through the inner jacket and rejected by the outer jacket of the separation screen is first loaded on the 24-in. belt conveyor. The larger material is not discharged on this belt until after this first load is well distributed. This serves two purposes. It enables a heavier loading of the belt, and by placing the smaller material on the belt first it is protected from excessive wear from the larger sizes of rock. The 24-in. conveyor dis-



Flow sheet for the Otay plant of the Spreckels Commercial Co. of San Diego

A general view of the Otay plant of the Spreckels company, showing at the left the rock plant, next the incline from

charges into a double-jacketed, sizing screen, where the aggregate is divided into three sizes, namely, 2½-in. rock, 1¼-in. rock, and pea gravel. Sufficient screen area has been provided so that the 2½-in. rock contains a very small percentage of a particle smaller than 1¼ in., and similarly the 1¼-in. rock contains a very limited percentage of pea gravel. The sizing screen, discharging three sizes of material, was provided with two 16-in. belt conveyor extensions.

The pea gravel passing through the outer jacket is collected in a bunker constructed by surrounding the supporting framework with timber walls, and the 2½-in. and 1¼-in. rock are discharged over the end of the belt conveyor extensions into stock piles on the ground. Under the storage so provided and extending a sufficient length to recover the bulk of the stock piles is constructed a concrete tunnel 6 ft. wide and 7 ft. high. The top of the tunnel is provided with gates at intervals of about 8 ft., by which the 16-in. belt conveyor which extends the full length of the tunnel and up an incline framework to the rock bunker may be loaded. This belt is also adapted, by the insertion of a stationary tripper, for loading railway cars.

At the time of writing the company is engaged in the construction of approximately 4½ miles of spur track to connect this plant with the San Diego and Arizona Railroad, this having been a portion of the plan held in mind at the time the plant was constructed.

The rock bunker has a capacity of 1000 tons and is divided into four pockets, three of which are used for holding storage of the three sizes of rock carried and the fourth to hold any particular mixture, which can readily be blended on the belt by drawing the proper amounts of each size from the stock piles. A considerable portion of the tonnage moved from this plant is for use on paving jobs; and as it is the practice in southern California with coarse aggregates for paving work, particularly portland cement concrete, to be delivered in batches, usually for five to seven sacks of cement, the Spreckels company is using a compartment batcher which volumetrically measures the proper amounts of two or more sizes at a single operation. This batcher was developed for Graham Bros., Inc., Long Beach, Calif., which firm holds the patents on the device. This method of proportioning has resulted in the delivery of rock mixes of extreme uniformity, and its control enables the maintaining of a low void content. Under the highly competitive conditions that exist in the San Diego market this fact has proved to be highly beneficial in stimulating sales, for it produces greater volumes of good concrete for each sack of cement used. Material not delivered in batches can be readily graded on the belt in the tunnel.

Sand Part of Plant

In the sand part of the plant, material that has been discharged from the separation

A complete view of the Spreckels plant showing the sand bunkers at the left, the stock piles above the tunnels, the the rock

the pit, and then the sand plant. The right hand portion of the picture shows the character of the deposit being worked

screen, together with the wash water, falls into the sand washer, where it is thoroughly scrubbed, and the product is carried up on a 20-in. belt conveyor to a vibrating screen where the sand is separated into two sizes. These separate sands are in turn conveyed up two parallel 16-in. belt conveyors to the top of a tower approximately 50 ft. above the ground, and then out two cantilever extensions for stock piling. As in the case of the rock storage, the sand storage has a concrete tunnel, generally similar, by which the sand storage can be removed to the sand bunker or for shipment by cars.

The construction on this plant was started on July 5, 1927, and was placed in full operation by the 15th of August succeeding. At that time it was considered that a daily capacity of 1000 tons of rock and sand would care for the company's needs. It is evident from the above dates that the plant is only one year old, but during the first six months of 1928 the average daily shipment exceeded 1800 tons per day. Even under this forced operation the plant has functioned as smoothly as could be expected from a rock and sand operation, for there have been no serious operating difficulties encountered.

Personnel

The construction described above was the result of a comprehensive investigation made for the Spreckels Commercial Co. early in 1927, at which time the writer was called to San Diego to make a study of the rock and sand situation in that market. All local deposits, whether developed or in a raw state, were studied and reported on. The Spreckels Commercial Co. just prior to this investigation had been thoroughly reorganized under the leadership of of Claus Spreckels as president and J. E. Stanley as vice-president and general manager. The new company was the outgrowth of the Spreckels Brothers Commercial Co., which had handled principally fuel and feed. The reorganized company continued to handle fuel and feed, but expanded its activities to cover a full line of building materials. To round out the plan it was essential that an adequate supply of clean and well graded rock and sand be obtained, and as a result of the investigations it was determined that the Otay River bed held the greatest possibilities both as to volume of reserves and quality of the material.

New Automatic Gravel Weigher

AN effort is being made at Bryon, Ill., to finance a factory for the manufacture of an automatic gravel and stone weigher, recently invented by John Markman, superintendent of the Illinois Central gravel pit at Foreston, Ill. One of the machines is now being used at Byron and it is said to operate perfectly in screening, washing and weighing gravel automatically.—*Freeport* (Ill.) *Journal.*

hoist house in the center at the head of the incline, the sizing screen and rock storage piles, and, at the extreme right, bunker

Sand Settling and Devices for Settling and Classifying Sand

Part XI—Principles of Hindered Settling

By Edmund Shaw
Contributing Editor, Rock Products

HINDERED SETTLING, mentioned in the last number of this series as being applied in several modern classifiers, is explained by Richards as follows:

"This [hindered settling] is where particles of mixed shapes and sizes and gravities in a mass, free to move among themselves, are sorted in a rising current of water, the rising current having much less velocity than the free settling velocity of the particles, but yet enough so that the particles are in motion. The arrangement of the particles is so positive that if one of them be moved up or down from its chosen companions, it will be found, when free, to return immediately to practically the same group as before."[1]

A column in which the grains arrange themselves in this way is said to be stratified. A diagram is shown in Fig. 52(*a*). It is said to have the grains in "full teter" when everything is working right, each grain being free to move but unable to move far without colliding with another grain. Under such conditions the mixtures of grains and solids behaves, as has been explained before, like a liquid of high specific gravity. The falling velocity of the grains is lessened proportionately.

Of course, in a classifier running continuously the condition shown in Fig. 5(e) cannot exist, as the column is filled with descending particles of different sizes. But the tendency to stratify still exists and urges the finer particles to the top while it allows the coarser particles to fall, thus causing a separation between the two.

What is sometimes of the greatest importance in commercial machines is that the mixture of sand and water may be made of sufficiently high specific gravity to actually float materials that would sink in the pure liquid, as shown in Fig. 52(b). It is for this reason that hindered settling classifiers may be employed not only to sort materials of the same weight into different *sizes* but to separate materials of different *weights*. In the mining industry this is taken advantage of to separate heavy minerals from quartz; in the coal industry to separate coal from slate, and in the rock products industry to separate sand and gravel and crushed rock of various kinds from trash, coal, lignite and, to a certain extent, from clay balls and shale.

[1] "Ore Dressing," Part I, p. 611.

Jigs as well as classifiers use the hindered settling principle, and both are used for the purposes just mentioned. The difference between them is that a classifier uses only the force in the rising current to make the separation, but a jig uses an additional means, the pulsating effect produced by vibrating a piston or plunger in the water or by vibrating a screen under water. This vibration is sufficient in itself to produce stratification and separation of substances of different weights. The earliest jigs were simple screens moving up and down in a tub or tank of water.

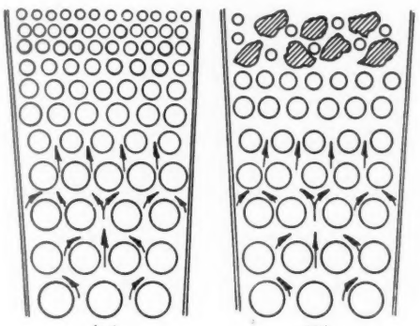


Fig. 52. (a) Showing a stratified column of grains with interstical currents, and, (b), such a column supporting grains of coal or other lighter substance

Jigs may be, and are occasionally, used on sands, but they are more often used on material of gravel size. They have not been much used in the rock products industry. However, they were successfully used in freeing gravel from shale at a plant in Iowa until a change in the bank material made them unnecessary. Their use in freeing gravel from lignite at the plant of the Central Gravel Co.'s plant in Memphis, Tenn., was explained in detail in ROCK PRODUCTS for September 18, 1926. An article on washing barytes in the Georgia field in the issue of January 23, 1926, also describes them.

An interrupted current, to give some jigging effect, has been used in one form of classifier. Aside from this, all classifiers of which the writer has any knowledge use a constant current with just enough force to hold the grains in suspension.

The difference in the design of hindered settling and free settling classifiers is in the portions of the parts, and almost any design of free settling classifier may be changed so that it will operate by hindered settling. A good example is the screw classifier. Commercial forms of this machine, changed so that they will operate on the hindered settling principle, which are now in successful use for removing trash and lignite from sand and gravel, will be described later.

Where any hindered settling device is used for separating two materials, as sand and the separation. For this reason some fine lignite, the stratification goes on along with sand will appear in the floating lignite. In coal washing it is customary to make a "middling" product which is treated in some other way, and this is also the custom in treating ores with heavy minerals. But where sand is separated from trash or coal or lignite the impurity taken out is of no value, and the fine sand which goes with it is usually not wanted, so that the mixed product may be discarded. This makes the plant and process much simpler than it is in the other industries.

Fine sand has been removed from the separated coal by *classification*, a reversal of the usual process. Prochaska says that this has been done on a commercial scale at one coal mine.[2] There were two classifiers in series; the first a hindered settling classifier from which the coal was floated off in the way that has been described. In the second the coal sank and was drawn off as a spigot discharge while the fine sand went out as an overflow. With plenty of water, so that the pulp was of low specific gravity, the larger coal grains would sink against a current that had too high a velocity to permit the fine sand to sink. This is an excellent example of the difference between free and hindered settling and also of the difference between what are called the free and hindered ratios[3] of minerals of different specific gravities.

Methods of Producing Hindered Settling Conditions

It will be easier to understand how hin-

[2] See "Coal Washing," by Ernst Prochaska, p. 69.
[3] By free and hindered settling ratios is meant the ratios of grain sizes of minerals of different specific gravities that fall at the same velocity under free and hindered settling conditions. Although not gone into here, these ratios are of great importance in concentrating metallic ores, and tables of them are given in works on ore dressing.

dered settling conditions are produced if a simple classifier employing them is described and discussed. The simplest form is one that contains nothing but a feed launder and a sorting column with the necessary attachments for admitting water and discharging the product.

In the free settling classifiers described it will be remembered that there was a body or receptacle above the sorting column into which the feed went first, and that there was some preliminary classification in this

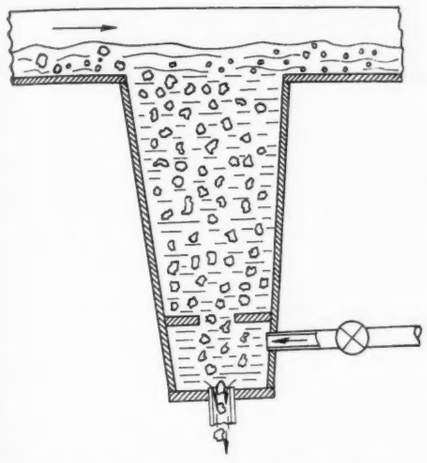


Fig. 53. The simplest form of hindered settling classifier

body. This was necessary because the sorting column was small in proportion to the volume of the feed. In hindered settling classifiers the sorting column must be much larger, for two reasons, the fall of the grains is slower, and it is necessary to have a substantial volume of the mixture of grains and water in order to maintain uniform conditions. There is not the close correspondence between the effect of the rising current and the diameter of the sorting column that there is in free settling classifiers.

The simplest hindered settling classifier is shown in Fig. 53 and it is a form that has been in everyday use. It somewhat resembles the launder classifier shown in Part IV. But in this hindered settling device the trap is dispensed with, the sorting column is square, and the sides have only a slight angle from the vertical. At the bottom is a square hole communicating with a water chamber below, into which the hydraulic water is admitted, and the water is admitted with only the force that is necessary to *balance* the column full of sand and water and give hindered settling conditions.

Grains flowing along the launder in the direction of the arrow will try to enter the sorting column and will sink in it if they are heavier than the grains held in suspension in the column. If the spigot opening at the bottom is the right size an equal number of grains will be discharged and thus the action will be continuous.

Note that only those grains which are *heavy* enough will enter the sorting column, for this is the most important feature of the classifier, whether used for separating sand into sizes or for separating two materials, such as sand and coal. The mixture of sand and water may have a specific gravity of 1.50 to 1.60, which will float lignite (sp. gr. 1.22) or soft coal (sp. gr. 1.36) quite easily. It will also prevent small grains from falling into the sorting column.

Hindered Settling Falling Rates

Something more is involved in true hindered settling than the specific gravity of the mixture of sand and water in the column. If that were all, the ratio of the free settling rate to the hindered settling rate would be as 1.65 is to 1.05 for ordinary sand grains in a pulp of 1.60 specifi gravity, as shown in Part I of this series. Actually the ratio is greater. The explanation is in the crowding of the grains and the space available for settling where true hindered settling conditions are maintained.

Richards determined experimentally the free and settling rates of quartz grains, and his results are given in the table below. The nearest mesh size has been substituted for the size in millimeters in the original table, as the differences are too small to affect the results much, and mesh sizes are more familiar to the majority of readers.

COMPARISON OF HINDERED AND FREE SETTLING FALLING RATES OF QUARTZ SAND GRAINS

Mesh Size	Falling Rate in mm. per Second Hindered settling	Free settling
3-mesh	116	295
4-mesh	113	249
6-mesh	69	207
8-mesh	50	166
10-mesh	41	134
14-mesh	32	106
20-mesh	21	80
28-mesh	13	60
35-mesh	....	42
48-mesh	6.5	34
65-mesh	3.3	23

These rates are for crushed quartz. From the differences between the *free* falling rates of natural sand and crushed quartz (given in Part I) it would be expected that the hindered settling falling rates of natural sand would have a greater velocity. The work of determining them should be undertaken.

The reader is asked to note especially the hindered settling falling rates of the smaller grains in the table. The ratio between falling rates *increases* as the sizes of the grains decrease. The difference between the falling rates of 3-mesh and 4-mesh is very little, but between 48-mesh and 65-mesh it is almost as 2 is to 1. As classification is mostly used on the finer sizes, the efficiency of hindered settling is found where it is most needed. One authority[4] says that he does not consider classification can be satisfactory except with hindered settling conditions. Such a sweeping statement is not justified, but it has some measure of truth.

Constricted Sorting Column

The sorting column in the classifier shown in Fig. 53 is *constricted*, and this is usual in hindered settling columns. It helps to induce stratification, keeping the larger grains to the bottom. In a column of the same cross-sectional area all the way the current rises with equal velocity in all parts, but in a constricted column the velocity is greatest at the bottom, where the area is least. Only the heavier grains can enter that part of the column.

The constriction may be obtained in other ways than by drawing in the sides to form a cone or pyramid, in fact the more usual way is to put a smaller column at the bottom. This is shown as No. 1 of Fig. 54, in which five shapes of columns that have been used in commercial machines are shown. In No. 3 the constriction is obtained by a diaphragm with a hole in it, and in No. 4 the diaphragm is replaced by a screen or grill.

But hindered settling conditions may be secured in a column without the constrictions shown. The writer has secured good results with cylindrical columns and believes that the cylindrical form is preferable where the machine is designed to separate sand from coal or lignite and for washing sand from clay, if it is desired to save the fines as much as possible. Where the purpose is to classify for any but the finest sizes the constricted column is to be preferred.

Admission of Rising Current Water

The water for the rising current may be admitted in other ways than at the bottom of the sorting column as shown in Fig. 53. In some classifiers it is admitted at the sides

[4]Edward S. Wiard, author of "Theory and Practice of Ore Dressing."

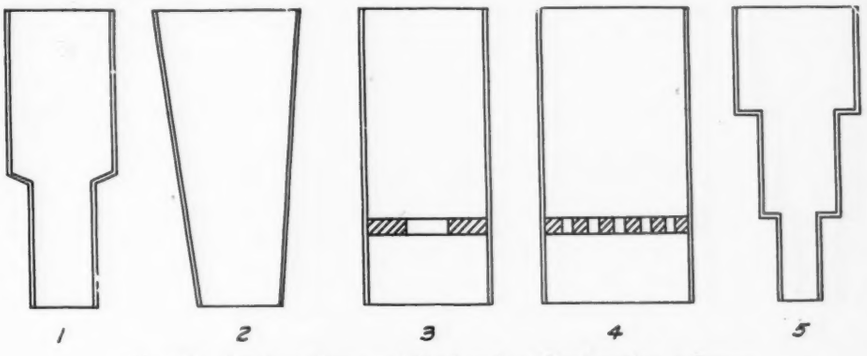


Fig. 54. Various shapes of hindered settling sorting columns

and in others at the bottom and the sides. Fig. 55 shows a sorting column like that of one of Richard's earlier classifiers. There is a chamber surrounding the column to receive the rising current water which is admitted to the sorting column through holes in the side. The purpose, it would appear, is to prevent the forming of clots and possibly to keep material from adhering to the sides, which might take place in a column of conical shape, with fine sand, for reasons which have been already explained. A somewhat similar arrangement is found in a commercial classifier (which has had some use in sand and gravel work) that is to be described in a following number. The vortex current, described in Part X, has been used, and also a current that has been given a whirling motion by a mechanical device.

Opinions differ as to the value of these methods. Wiard[5] says: "Once . . . conditions are obtained for maintaining a crowded column of grains of sufficient depth, hindered settling of great perfection will be obtained regardless of the mode in which the water is introduced." He experimented with the vortex current and some other methods and could find no difference in the results after the classifier was running steadily.

At the same time it was evident that other investigators have found that the ordinary method of admitting the water could be improved upon, for so many of them have tried it. What is wanted for theoretical perfection is a steady rise of the water in all parts of the column so that the grains will be evenly distributed throughout the column. Any currents that cause channels or eddies cause uneven distribution and it is sometimes difficult to prevent them, especially channeling currents.

[5] "Theory and Practice of Ore Dressing," p. 354.

In one of the writer's classifiers the water was admitted through a screen on the bottom of the column and the screen was covered with small pebbles, just too large for the current to raise. This gave a very even current for a time; so long as the classifier ran steadily, in fact. But in starting and stopping, small grains worked down into the bed of pebbles and choked it, after which channels formed. Then the classifier had to be emptied and the pebbles cleaned. This required much attention and lost so much time that the method was given up.

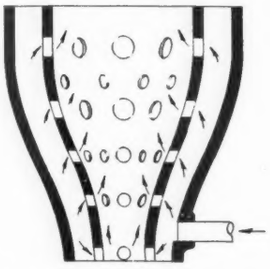


Fig. 55. Sorting column with outer water chamber, the water being admitted through holes in the side of the column

Maintaining Uniformity in the Column

Like any other classifier, the hindered settling classifier must be adjusted when there are changes in the feed. It is evident that if more grains are discharged from the spigot at the bottom than enter at the top, the mixture in the column will get too thin for hindered settling, so the spigot must be partly closed to allow the sand mixture to thicken. If the spigot opening is not large enough, sand will accumulate in the column until a quicksand forms, and then the overflow will contain much coarse material that ought to go out of the spigot.

With a sorting column of good size, and a body above that will hold a considerable volume of sand and water, minor variations in the feed are taken up in such a way that the classification is not affected. The greater variations in the feed do not come so often (in a well-run plant) that the attention they cause is burdensome. In fact, the labor of looking after a hindered settling classifier is no more than that required by a free settling classifier.

Nevertheless, it was early recognized that it would be well to make the classifier so that it would automatically compensate for variations in the feed. There are several classifiers that will do this, but the parent of them all is the German invention called the *herberswache,* or siphon washer. It is generally classed as a jig in the older textbooks, because it does the work usually done by jigs, but it is really a hindered settling classifier.

The drawing of the original machine, which may be found in such books on ore dressing and coal washing as those of Richards and Wiard, is somewhat complicated. For this reason the writer shows a machine of his own design, in which the same principle is applied, which is simpler in its details. This is shown in Fig. 56.

The Principles of the Syphon Washer

The principle on which it operates is that of balancing the hindered settling column by a column of clear water. Any variations in the hindered settling column will cause variations in the clear water column, so that it will rise or fall to correspond with the specific gravity of the mixture in the hindered settling column. A float on the clear water column may thus be made to open and close the valve by which the hindered settling column is discharged. If there is too little sand in the column for normal specific gravity the valve will close until sand accumulates, and if there is too much sand the valve will open wider than it usually does, to allow more sand to flow out.

Referring to Fig. 56, the feed flows over the hindered settling column in the launder marked *a,* and any grains which are heavy enough fall into the column marked *b.* Clear water is admitted to the bottom of the column from the chamber marked *c,* and this is supplied from the pipe and valve seen at the left of *c.* The water goes into the settling column through the bed of pebbles described above.

Normal hindered settling conditions called for a specific gravity of 1.50 in the hindered settling column, and this would balance a column of clear water in *c* 1.5 times as high, the height above the line A—A. If the specific gravity in the hindered settling column rose to 1.60 the water in *c* would rise to the dotted line and the float would rise with it and open the valve at the bottom of *b* very wide. A corresponding fall and closing of

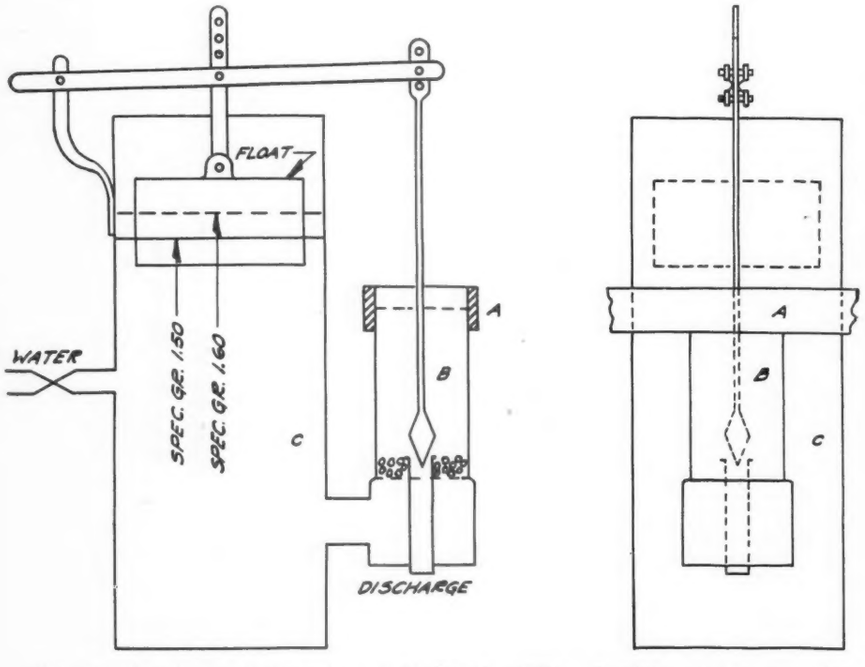


Fig. 56. Section and elevation of hindered settling classifier with means for controlling the specific gravity of the mixture in the sorting column

the valve would take place when there was too little sand in *b* and the specific gravity fell below 1.50.

Several of these machines were used by the Stewart Sand Co. of Kansas City for about a year, but they required too much attention to be satisfactory. Part of this was due to the trouble with the pebble bed, as has been explained, and part of it was due to sediment from the river water which collected wherever the "clear" water ran. The machine was finally discarded to be replaced by another which will be described with other similar machines later.

(To be continued)

Right of Purchaser to Damages for Crusher's Failure to Produce as Warranted

By Leslie Childs

IN THE PURCHASE OF MACHINERY for the handling of rock and stone its capacity to produce may be the first consideration from the buyer's standpoint. The question then, of the right of such a buyer to recover damages from the seller, for the failure of the equipment to produce as represented, may be one of great importance.

In the first place, it may be broadly stated, that, the right of a buyer of machinery to damages in cases of this kind will usually depend upon the contract of purchase. If the buyer accepts such equipment, on his own knowledge of its capacity, the seller may not be liable if in operation it produces in a disappointing manner, providing the seller has acted in good faith and delivered according to contract.

On the other hand, if the buyer exacts an express warranty of capacity, after a full disclosure of the purposes for which the machinery is to be used, we have a quite different situation. And, in cases of this kind, a failure to produce as warranted will usually give the buyer the right to recover damages suffered thereby, which were within the contemplation of the parties when the contract was made. The application of this rule of damages is illustrated in an interesting and instructive manner in the Washington case of Smith v. Roadmakers' Equipment Co., 255 Pac. 657, which arose under the following facts.

Capacity of Rock Crusher Warranted

In this case Smith had a contract with the federal government to furnish a quantity of crushed rock. By the terms of the contract, the rock was to be furnished within a certain time, with a penalty attached for delay, and in order to complete the contract on time the services of a reduction crusher of 10 cu. yd. per hour capacity was required.

In this situation, Smith got in touch with the equipment company, and it sent a representative who examined the quarry where the rock was to be produced and noted conditions there. At this time a McCully gyratory primary crusher had been installed, and the reduction crusher was desired to operate in connection therewith. This representative was also fully informed of the necessity for a crusher that would produce 10 cu. yd. per hour in order that Smith might fulfill his contract.

Following this inspection, the equipment company informed Smith that it could furnish him with a crusher of the desired capacity at a price of $3,175. A contract of purchase was thereupon entered into, Smith paid $1,000 in cash, and gave promissory notes for the balance. This contract, among other things, contained the following express warranty as to capacity:

"Guaranteed to produce 10 yd. per hour of rock that will pass through a 1-in. ring; feeding material from a No. 8 McCully crusher or a crusher of equal size. . . ."

Thereafter the reduction crusher was installed, but fell short of producing 10 yd. per hour according to the warranty. It was then too late for Smith to get another crusher, so in order to fill his contract he worked extra shifts at night. He kept account of the extra expense this cost him, and following the completion of his contract with the government brought suit for damages against the equipment company to recover his loss caused by the failure of the crusher to produce according to the express warranty.

In defense to this action, the equipment company contended that the failure of the crusher to turn out 10 cu. yd. per hour was caused by certain defects in other parts of the quarry plant, as well as the method of operation. On the other hand, Smith introduced evidence which tended to show that the crusher would not produce as warranted because of the character of the rock.

On this conflicting evidence, the trial court found in favor of Smith's contention. And, since the equipment company had warranted the capacity of the crusher, with full knowledge of the kind of rock to be worked, held it was liable for the extra expense caused by this failure of the crusher to produce 10 yd. per hour. This expense was then computed at $1,430, and judgment was rendered in favor of Smith for this amount. From this, the equipment company appealed, and the higher court in stating the general rule as to the allowance of damages for breach of warranty, in part, said:

The Language of the Higher Court

"The general rule is for breach of warranty such damages may be recovered as can be fairly and reasonably said to arise naturally out of the breach according to the usual course of things and such as can be reasonably considered to have been in contemplation of both parties as the probable result thereof. . . . Within this rule special damages may be recovered when they can be said to be . . . the proximate and actual result of the breach."

Following the foregoing statement of the general rule, the court in applying it to the facts of the instant case reasoned, in part, as follows:

"In Hausken v. Hodson-Feenaughty Co., . . . 187 p. 319, a tractor had been sold by the defendant to the plaintiff, and at the time of the sale the seller was informed of the work which the purchaser intended to accomplish by the use of the tractor, and it was there held that the plaintiff could recover special damages that he had been put to in providing other equipment to do the work for which he had purchased the tractor.

"That case is very much like the present, and if the plaintiff there was entitled to recover the additional expense that he had been put to by reason of the failure of the tractor to perform as it was warranted to do it would seem to follow that the respondent (Smith) here is entitled to recover under similar facts the same character of special damages. . . . The judgment will be affirmed."

Conclusions

The foregoing case constitutes a well considered illustration of the application of the general rule of damages for the breach of warranty of capacity of machinery. And, in the light of the facts and holding thereof, it is clear that the breach of such a warranty may permit a recovery by the buyer of all items of damages, that were within the contemplation of the parties when the contract was entered into. Truly, the decision is one that buyers and sellers of quarry equipment may well have in mind, when contracts for the sale thereof are being entered into.

A $5000 Reward*

For the Location of a Deposit of Quartzite, Calcite, or Dolomite Showing the Reactions Outlined Below

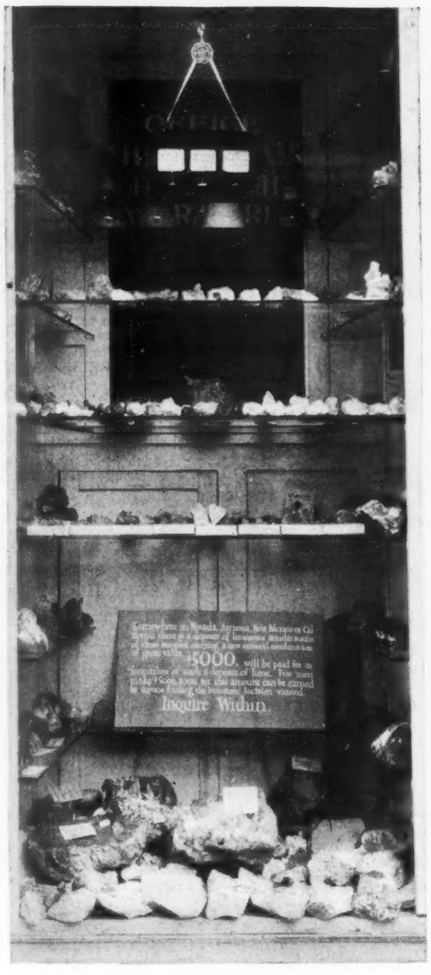
By Dr. Eles
Chemist, The de Clair Laboratories, Los Angeles, Calif.

CONSIDERABLE INTEREST is being shown at the office of the de Clair Laboratories of Los Angeles, Calif., by a window display in which is shown a very excellent collection of western minerals, ranging in size from 1 in. to large, massive museum specimens. These are not for sale, but simply an exhibit to call attention to a large sign on which there is offered a reward of $5000 for the location of an ordinary dolomitic limestone deposit which is known to occur somewhere in California, Arizona, New Mexico or Nevada. It is supposed to be an outcrop of pre-Cambrian formation. Possibly a similar deposit may be found in other states or countries.

Dr. Eles, of the de Clair Laboratories in his research work, made the discovery that a certain specimen of dolomite was extremely sensitive to static electricity. It is a well-known fact that selenite is a conductor of electricity in proportion to its exposure to light. In absolute darkness, selenite is not sensitive to electricity but the flame of a match or candle or the glow of an electric light (and even daylight) will make it so sensitive that if used as a switch it will ring a bell or give any other electric signal that is necessary. Selenite becomes a conductor, therefore, by means of light vibrations. But the dolomitic limestone referred to in this article is thousands of times more sensitive to static electricity than *selenite!* The limestone does not become a conductor of electricity but it is so sensitive to static electricity that it will respond to such influence, even through 2 in. of solid porcelain or if insulated by 1 in. of lead, 1 in. of water or 1 in. of iron from freezing temperature up to 1000 deg. F. On the other hand a magnet does not affect it, neither does a direct current from a motor. Nor has a battery current, either storage or primary, any effect on it. Radium and X-rays likewise have no effect on it.

Dr. Eles sent some of this limestone to an associate in Europe who has developed further reactions and discoveries, which are valuable enough to warrant the offer of $5000 for the location of such a deposit. This means, of course, that upon location or the discovery of such a mineral deposit parties interested would naturally buy the deposit. About 2 lb. of this mineral has been obtained by the de Clair Laboratories and sold abroad to interested people at $84 a pound, making this ordinary looking material far more valuable than the richest of gold ores.

In appearance the dolomitic limestone is granular, of reasonably fine grains, slightly coherent. It has perfect cleavage; fracture



How the reward announcement was posted

subconchoidal; it is brittle, with a hardness of 3.5. It has a vitreous or glossy luster; it varies in color from white and greenish white to reddish-brown, and semi-transparent.

The mineral is composed of carbonate of lime and magnesia in various proportions. One sample analyzed by the de Clair Laboratories carried traces of carbonates of iron and manganese.

Tested with the spectroscope, under an electric spark, produced by 80,000 volts, the limestone gave a number of very beautiful absorption bands, covering all of the colors of the rainbow, together with some very brilliant light yellow, green and blue lines. The whole spectrum with its brilliant colored bands is the most beautiful thing that can be seen through the spectroscope. At 160,000 volts it resolved into Frondhoffer's lines.

As we know, the Frondhoffer's lines of the spectrum are produced by the electrons escaping from the atoms. In fact, all chemical action is produced by free electrons. There must be some very strange dynamic force combined in this mineral which is so sensitive to static electricity that once again we may change our new knowledge of the actions of protons and electrons. The reactions are altogether different to those of radium, radium emanation or radium rays.

Tested on the electroscope, the limestone showed no reaction whatever, yet after exposure to a very slight electric current it would discharge the electroscope almost as rapidly as pure uraninite. This ability to discharge the electroscope remained in the mineral for a week after an exposure to current, after which it became neutral as far as the electroscope tests were concerned.

There are, of course, a number of other discoveries and reactions made by the de Clair Laboratories and friends that are of a confidential nature and it would not be fair to those interested in the financial end to make these discoveries and reactions known to the public at present.

The peculiar properties of the calcium and magnesium contained in the dolomitic limestone have also been found in certain quartzites.

It is quite possible that this new dolomitic limestone will answer the vexed question of scientists as to—what is magnetism? An electric field creates a magnetic one. The North Pole of the earth, situated at its axis, is quite a distance away from the magnetic pole which attracts the needle of the compass and it is at either extreme pole that the phenomena, known as the aurora borealis, takes place.

Dr. Eles believes that the weird lights are caused by static electricity, forming its magnetic lines at each pole of the earth. At certain seasons in the atmosphere of the sun there are a number of black spots which are

*Reprint from the September issue of *Rocks and Minerals.*

really openings in the photo and chromosphere of that incandescent globe. Dr. Eles believes that with an opening of this sort, large enough to swallow the earth with ease, there is a lack of electrons shooting through space and that when this happens interference is caused with the static electricity of the North and South Poles, creating electron disturbances. This makes the beautiful curtains of visible static electricity which

A 12-oz. piece of the dolomitic limestone which sold for $63

wave and move in space with a crackling noise, producing the aurora borealis, which the specially fitted yacht, *Carnegie*, carrying no iron or steel in its makeup has gone out to investigate.

Dr. Eles passed his discoveries on to a brother chemist in Europe, who in turn made some additional discoveries that appear to be of value in the arts. The reward of $5000 is offered anyone who can give definite location where a quartzite, calcite, dolomite or any other mineral carrying the above reactions can be found. The de Clair Laboratoriets will analyze—free—any mineral sent to its office (with name of locality where found) and is ready to pay the reward upon proof of the discovery of the locality only and not for the property itself.

Cement Cartel in Europe Aims at United States Market

An article by Richard J. Beamish in the Philadelphia (Penn.) Enquirer

EUROPEAN COMBINATIONS against the industrial supremacy of the United States are for the most part deep hidden in the offices of bankers. Now and then a clue is found which leads to revelation of one of these compacts.

One of these discoveries came while the writer was investigating the cement industry of Belgium and Luxemburg. Belgian cement is flowing into the United States in a great and increasing tide. It usually comes in duty free, as ballast. The resulting damage comes not only to American cement manufacturers and their employees, but also to the soft coal mines, which supply the cement mills with fuel necessary for cement making. Every large shipment of foreign cement coming duty free to an American port dislocates the market at that particular point.

Continental Europe manufactures approximately 50% more cement than it uses at home. It is this overproduction that is the cause of the all-European cartel that has just come into being.

The corporate foundation of the gigantic combination is the Societe Continentale des Ciments, incorporated in Brussels, with a nominal capital of forty million francs. This comparatively small sum is a small fraction of the total involved in the cartel.

While details of territorial allocations, price-fixing and production limitations are kept from the public, it is known that competition with the big cement mills of the United States is the main objective. It is also known that the cartel is doing what it can through its agents in the United States to prevent the election of Herbert Hoover to the Presidency. Fear that cement will be taken from the free list and a tariff placed upon the foreign product, which would assure the American market to American cement manufacturers and workmen, is avowedly at the root of this opposition.

The cartel commenced to function two months ago, and will continue in operation for one year. That one year's agreement covers the period of the Presidential campaign and election in the United States. If Mr. Hoover shall be elected (this article was written before the recent presidential election), and an adequate tariff shall be placed upon cement, the cartel will be purposeless so far as this continent is concerned, and probably will be dissolved. In the unlikely event of Mr. Smith's election, it probably will increase in vigor and power and will add its pressure to that from other European cartels in the effort to lower the already inadequate tariff wall.

That the cartel has real power in the United States is abundantly demonstrated by the ease with which efforts to safeguard American municipal contracts for domestic cement producers were defeated through political alliances with the cement importers.

While the cartel is domiciled in Belgium, its initial impetus came from Warsaw. Great plants which formerly were in Russian and Austrian territory are now sources of national wealth for Poland. It was to find an outlet for this Polish production that a conversation was arranged last June in Prague, which was attended by Austrian, Czechoslovakian, German, French, Italian, Spanish, British, Polish and Danish representatives of cement and financial interests.

Preparations had been made for the conversation by carefully guarded correspondence, and by understandings and arrangements between pairs and other groupings of the national participants. The war-born economic union of Belgium-Luxemburg and its international guardian, France, came to an agreement in December, 1927, whereby French territory was protected from invasion by the production of its neighbors.

Germany, desiring a free hand in Holland, which uses great quantities of cement annually, had made terms with Belgium-Luxemburg by which the Dutch nation was allotted to it in return for guarantees that Germany would not compete with Belgium-Luxemburg in North America.

The conversation in Prague, and its successors in Warsaw and Brussels, decided that European cement plants should be kept running at capacity for the purpose of reducing overhead expenses to a minimum, and that the overproduction resulting from this policy—calculated conservatively at 50% of the total output—should be marketed outside of Europe at cost or somewhat below cost.

It was argued that low-priced labor, absence of any American tariff, the subsidies given to European shipping by various countries and the unification of sales force and sales policy as contrasted with high American wages, the lack of American ships and the handicapping of American manufacturers by American work standards would enable the all-European cement cartel not only to undersell American cement in South America, but also to invade the United States itself.

The United States has been in the forefront of this industry. If it shall fail to protect American plants and American cement workers by an adequate tariff, it will soon lose that leadership. European industrialists and financiers are fully awake to their opportunity. In every country where cement-making is possible, large and improved plants are being established.

Cement is not the only product of Belgium which competes with American basic output. Iron, steel, coal, textiles and ceramics are high on the competitive list. The Belgian workman is one of the poorest paid in the world. Rated in the world-index of real wages, with London fixed at the 100 mark, the workman of Brussels is rated at 46, as compared with the Philadelphia worker's real wage mark of 192.

Not only are wages low in Belgium and Luxemburg in all the industrials, but living and working conditions are so far below the standards demanded by American workers that comparison is impossible. American men and women simply would not compete upon a basis which would deny children the educational advantages now obtainable everywhere in this country, which would take from American women the measure of economic independence they have achieved, which would again widen the gulf between capital and labor, and bring communism as the only goal toward which the workers could travel.

Scientific Merchandising of Concrete Aggregates

A Further Discussion Detailing Methods of Selling Aggregates Through Comparisons of Whole Construction Costs

By Stanley M. Hands
General Manager, River Products Co., Iowa City, Iowa

THE value of concrete aggregates is relative and varies with the characteristics of the aggregates. These characteristics determine the amounts of the various ingredients that are required to make 1 cu. yd. of concrete, and therefore the cost of concrete varies with the cost of the ingredients. The manner in which the concrete is to be used determines the exactness required in the production. Skillful preparation of concrete aggregates will enable the producer to sell at a premium, providing he has an "understanding market."

An "understanding market," as we use it, is one in which the fundamentals of mechanics has precedent over political expediency. It is a market in which the laws governing the economics of design operate freely to determine the costs of construction. To those producers who are selling in a protected market or a controlled market this article may have no value, but to the producer who sells in a free and sharply competitive market the manufacture of "premium aggregate" offers the best solution of the problem of profitable merchandising.

That some educational work will be required to permit the fullest utility of a premium aggregate is admitted. There are too many plans and specifications that are written to utilize the drafting room charts and diagrams based on old and lesser unit concrete strengths. Such office practice will continue until someone forces a change. It does not mean that a producer cannot bring about that change. He can force the matter without harm to himself if he be as judicious in promotion as he must be in selling.

We are entering an era of new standards in concrete. In fact, some localities have entered well into the usage of these new standards. In other areas new pathways lead to better practical usages of concrete and concrete aggregates. Concrete knowledge has passed from the laboratory to the field. The growing understanding of the application of the basic laws of controlled concrete must and will become recognized by the user of concrete. His demands are going to be for the premium aggregate. The producer will do well to read the writing on the wall.

One of the noteworthy indications of the tendency in concrete is the distribution of Arthur R. Lord's* "Handbook of Reinforced Concrete Building Design." This manual sets out the advantages in using concrete of known predetermined strength in building design. It is prepared for the designer and includes all tables, charts and formulas to permit immediate adoption in the drafting room. The comparisons of costs as effected by the use of concrete of different unit strengths is logical and conclusive. The appearance in the practical field of this book by a man of Mr. Lord's ability will be of untold assistance in improving methods and practices. I have a letter from Mr. Lord which in part says: "There is no question in my mind but that the economic value of different aggregates varies markedly and that eventually aggregate producing better concrete will sell at a premium."

Material for Extensive Program

Extensive programs, involving the use of materials from widely scattered sources, complicate the administration of specifications based on designed mixtures. It is always necessary to state the approximate quantities of materials required per unit of concrete to permit the contractors to figure their bids. Since the amount of material required for a cubic yard of concrete of given unit strength varies with the grading characteristics of the materials, it follows that there might be as many tables of quantities as there are materials.

However, a comprehensive survey of the various sources of materials will generally show that a reasonable amount of process will change the characteristics sufficiently to give them classification under a few headings. The screen analysis, indicating the characteristics, enable the engineer to bracket similar materials to show approximately the amounts of each material required per unit of measured concrete.

The Iowa Highway Commission's specifications include a clause covering the screen tests to determine the bracket in which a material may be used. A producer may elect to meet any of these screen tests and the contractor may elect to mix in any of these brackets, the cheapest combination of prices for the sand, cement and coarse aggregate being determined from the quantities in the table.

Sale prices of aggregates sold under this specification are determined by comparison of the costs of the total materials required for one mile of concrete pavement. A producer (A) makes a coarse aggregate which meets the screen tests for the first bracket and which has a specific gravity of 2.65, but he has no sand to sell since he is a stone producer. He makes arrangements with a sand producer who has a surplus sand production to tie the sand and stone together. Another producer (B) is selling material in the third bracket to avoid wasting sand at the producing point. B's price is 80 cents per ton and the specific gravity of his material is 2.69. The tables of quantities are corrected for this increase over the base specific gravity by the proportion: 2.65:2.53:: 2.69:X. Hence X equals 2.60. The gain in weight required for the third bracket proportion is 2.8%. The amount of coarse aggregate needed is 1984.5 tons per mile instead of 1911 tons as given in the table. Calculations are:

Third bracket:
4017 bbl. cement at $2.10 per bbl...$ 8,435.70

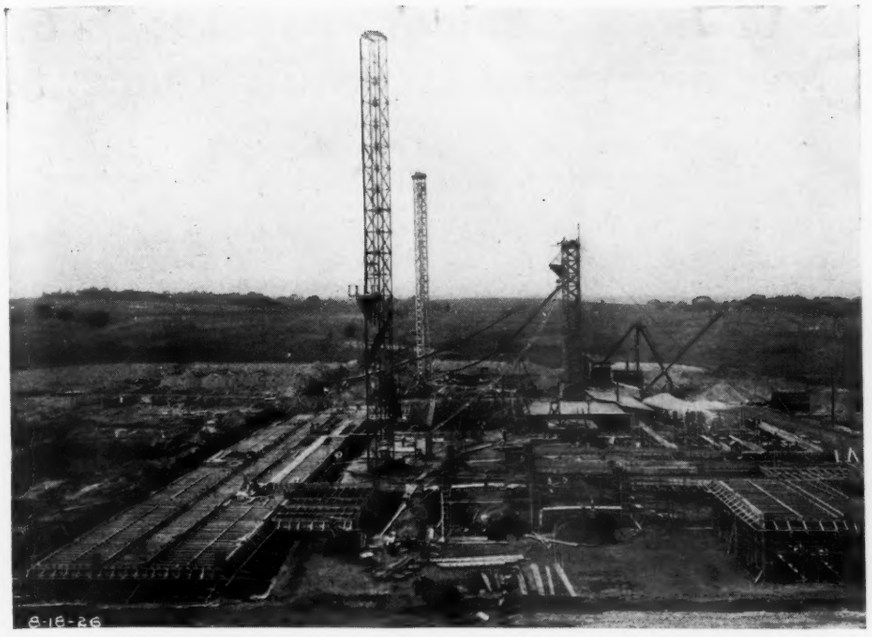
*President, Lord and Holinger, architectural engineers, Chicago, Ill.

ESTIMATED QUANTITIES OF MATERIALS FOR TYPE A CONCRETE PAVEMENT
18 FT. WIDE, 7 IN. CENTER, 10 IN. EDGE

	Without curb	With curb
End area	11,543 sq. ft.	11,845 sq. ft.
Steele per mile	15.3 tons	15.3 tons
Concrete per mile	2257 cu. yd.	2316 cu. yd.
Concrete per station.	42.75 cu. yd.	43.87 cu. yd.

Proportions given by weight	Cement Bags per station	Cement Bbl. mile	Sand Tons mile	C. Agg. Tons mile	Cement Bags stat.	Cement Bbl. mile	Sand Tons mile	C. Agg. Tons mile
(1) 1:1.71:3.47	270	3679	1183	2400	286	3775	1214	2463
(2) 1:1.93:2.91	292	3859	1400	2111	300	3960	1437	2167
(3) 1:2.06:2.53	304	4017	1556	1911	312	4123	1596	1961
(4) 1:2.17:2.17	316	4175	1703	1703	325	4285	1748	1748
(5) 1:2.25:1.85	328	4333	1833	1507	337	4447	1881	1547

Proportions by weight determined from screen tests and cement water requirements. The proportions are based upon aggregates having a specific gravity of 2.65. If materials are furnished which have a specific gravity of more than 2.67 or less than 2.63 the proportion will be adjusted in accordance with the ratio which the actual specific gravity bears to 2.65.



The mixing layout for the General Hospital Iowa City Iowa. No trouble from segregation occurred as the material was well graded and batched. Use of an inundator resulted in uniform water content

1556 tons of sand at $1.05 per ton.. 1,213.80
1984 tons coarse aggregate at 80c plus freight (80c)..... 3,174.40

Total cost of material third bracket for one mile.....$12,823.90
First bracket:
3679 bbl. cement at $2.10 per bbl.....$ 7,725.90
1183 tons of sand (best price available) at 90c..... 1,064,70
2400 tons first bracket coarse aggregate ....

Total costs of materials other than coarse aggregate.....$ 8,790.60
Difference left to buy first bracket coarse aggregate .....$ 4,033.30
Sale price of first bracket 2400 tons at $1.70 per ton .....$ 4,033.30

Producer (A) has a sale price of $1.70 per ton, leaving him a price of $1.30 f.o.b. his plant. The best price under volumetric proportions which disregarded the grading and cement yield would have been $1.57½ f.o.b. contractors set up or $1.17½ f.o.b. plant.

Further study of the table of quantities indicates the need for intimate knowledge of the products and marketing practices of cement, sand, gravel and stone producers with whom there is a possible chance to compete.

In many cases of selling, especially to the building contractor, the quantities of materials required to make a cubic yard of concrete cannot be determined before the material is delivered on the job. This is due to the fact that the specifications do not adequately cover the manner of making the concrete.

An experience on one of these jobs indicates the great losses that often result from selection of materials on a basis of price only. A certain producer secured a rather large order and had some of his material on the ground. Various combinations of materials were tried before a satisfactory workable mix was obtained. The mix that was finally used required more cement than the contractor had used in estimating the cost. Since the competing producer had not guaranteed the cement yield, the contractor stood to lose on the additional cement. The order for the material was cancelled.

Comparison of Costs

The contractor offers this evidence to justify the change in material:

Original material. Quantities per cubic yard of concrete.
1.48 bbl. of cement at $2.60....$3.85
0.42 cu. yd. sand at $1.65..... 0.69
0.94 cu. yd. gravel at $2.15.... 2.02

Total cost of material.....$6.56 per cu. yd.
Second material.
1.34 bbl. cement at $2.60.....$3.48
0.47 cu. yd. sand at $1.65..... 0.76
0.83 cu. yd. stone at $2.78..... 2.31

Total cost of material.....$6.55 per cu. yd.

A discount of 10c per ton on the second material made part of the saving, but by far the greatest saving was in the labor. Better workability in the second material concrete released two men on the slab.

The well graded aggregate sold for $2.68 per cu. yd. net as compared with the poorly graded aggregate which was not worth the price asked of $2.15 per cu. yd.

The greatest sales advantage in a well graded aggregate is found in the application of the laws of designed concrete and their effect upon the mechanics of building design. It is a known fact that concrete unit strengths can be predetermined and the proper mixtures determined according to the characteristics of the aggregates.

It is interesting to speculate on the saving in building costs in using 3000-lb. concrete instead of the usual 2000-lb. concrete. The costs of the material for 3000-lb. concrete is estimated as follows:

1.54 bbl. of cement at $2.60.....$4.00
0.52 cu. yd. of sand at $1.65..... 0.86
0.70 cu. yd. of coarse aggregate at $2.75 1.93

Total cost of material.....$6.79

This cost compared to the cost of the 2000-lb. concrete made from materials shown above is less than 4% greater, but the strength is 50% greater. Applications of the laws of mechanics will absorb this increase in cost of material. The saving in costs of building for all loads and spans by the use of higher unit strengths are effected over the entire building. Mr. Lord lists these savings as follows:

1. The savings increase (but at a decreasing rate of increase) with the number of stories in the building.
2. The saving increases as the soil pressure decreases.
3. The saving increases slightly with large panel sizes.
4. The saving increases markedly with heavy loads.

The Medical Laboratory at Iowa City was carried on flat-top square footings laid on

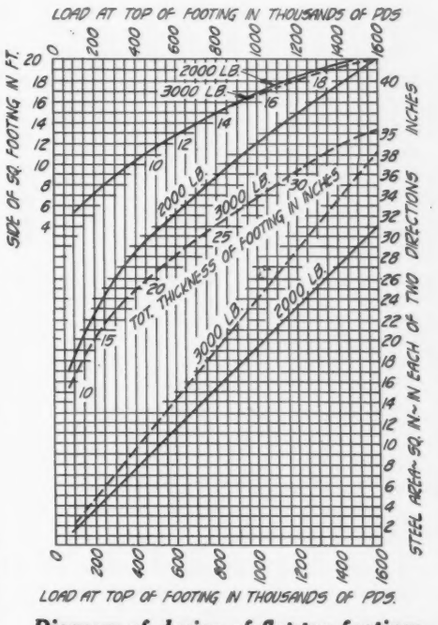


Diagram of design of flat-top footings, with Y_c=0.03f'c for 4000-lb. soil and 2000- and 3000-lb. concrete

soil which carried safely 2 tons per sq. ft. The footings were designed against this load and on a basis of 2000-lb. concrete. The dimensions used may be checked and taken from the accompanying diagram for either 2000-lb. or 3000-lb. concrete.

The size of the footings in each case is 7 ft. square to give the necessary soil bearing. The thickness, however, varies. Using 2000-lb. concrete, the thickness required is 17¾ in. Using 3000-lb. concrete, the thick-

ness required is 15 in. The difference in thickness is 2¾ in. and the saving in concrete is $\frac{7\times7\times2.75}{12}$ equals 6.3 cu. ft. or 23%.

Comparison of the costs of using the two unit strengths given may be shown as follows, the unit costs of concrete being as previously shown:

2000-lb. footing: $\frac{7\times7\times1.46\times\$6.56}{27} = \$17.38$ material only.

3000-lb. footing: $\frac{7\times7\times1.25\times\$6.79}{27} = \$15.14$ material only.

Saving in cost of material, $2.24.

Since the increased unit strength of concrete is used there must be an increase in the amount of steel used. This is necessary to balance the stress condition. The amount of steel used is:

From diagram:

2000-lb. concrete requires 2×3.5 sq. in. steel.
3000-lb. concrete requires 2×4.5 sq. in. steel.
Length of steel is 7 ft. minus.

Summary of costs of material and steel.

2000-lb. concrete	$17.38
178 lb. reinforcing steel at 3½c	6.23
Total	$23.61
3000-lb. concrete	$15.14
219 lb. reinforcing steel at 3½	7.66
Total	$22.80
Difference	0.81

There is approximately 2.25 cu. yd. of concrete in each footing. The saving is therefor 36 cents per cu. yd. If labor and labor insurance were considered the saving would be increased. This item should, however, accrue to the contractor, leaving the saving in the cost of concrete to be divided between the owner and the producer of the aggregate. That part, namely, 18 cents per yard is his premium.

The diagram reveals the manner in which these savings vary. For the same load the 3000-lb. concrete requires more reinforcement than the 2000-lb. concrete and this difference increases as the load increases. However, to offset this, as the load on the footing is increased, the thickness of the footing increases, but this rate of increase is less for 3000-lb. concrete than for 2000-lb. concrete.

The use of 3000-lb. concrete will be more economical than the use of 2000-lb. concrete in almost every case. If the idea is adopted by engineers and architects the saving in structural design can be applied to giving some more artistic finish and individuality to our buildings and to cutting the costs of office rent. Some one said that what the country needed was a good 5-cent cigar. I say we need more skill in design, more skill in producing aggregate, more skill in selling, more skill in mixing. Things which are the product of skill become monopolistic. Would not you, Mr. Producer, enjoy the privilege of monopolizing your market for just one year? We would all go to California for our vacations.

Inter-State Cement Corporation to Develop Special Hydraulic Cements

Rosendale, N. Y., Natural Cement Properties to Have New Lease of Life

THE INTER-STATE CEMENT CORP., the incorporation of which under the laws of Delaware, with a capital of $250,000, has been noted previously in our news columns, has purchased a large acreage of the old Rosendale Cement Co. property, near Kingston, N. Y., preparatory to manufacturing mason's cement and kindred products on a large scale.

It is the intention of the company, we are officially informed, to manufacture a high grade mason's cement for all kinds of mortar, under a special chemical formula and process. It is also the intention to manufacture all kinds of lime, including high calcium, magnesium, hydraulic, and Grappier cement. In addition to masonry cement, a special cement for sewer pipe joints, etc., will be made, as well as stucco and other miscellaneous byproducts.

Plans are now being prepared by Soule and Zepp, engineers, Baltimore, Md., for the new plant, of the latest design and equipment. The first unit will be capable of producing 3,000 bbl. per day, with an ultimate capacity of 6,000 bbl.

Track connections will be had with the Wallkill Valley Railroad Co. of the West Shore Division of the New York Central Lines. It will also be possible to ship by boat via Rondout Creek to the Hudson river.

The plant office will be at Rosendale, N. Y.. Until about November 15, there will be a temporary office at 1048 Leader building, Cleveland, Ohio. General sales offices will be established shortly after the first of the year in New York City, with branches at Philadelphia, Boston, Pittsburgh, Cleveland, Detroit and Washington. The products will be marketed in the entire eastern part of the United States.

John A. Kling, Chairman of the Board

The new enterprise has the following officers, several of whom are well-known throughout the rock products industry: John A. Kling, chairman of the board; Arthur E. Friedman, president and treasurer; Stewart T. Burton, first vice-president and general sales manager; John B. Morton, second vice-president; and Edgar A. Hahn, secretary. The board of directors consists of: John A. Kling; Arthur E. Friedman; Stewart T. Burton; Edgar A. Hahn; C. K. Sunshine; Myron A. Cohen, and C. J. Hays.

Mr. Kling is chairman of the board of the Kelley Island Lime and Transport Co., president of the Cleveland Builders Supply and Brick Co., and connected with other prominent rock products industries. Mr. Friedman has been identified with the Carney Cement Co., of Mankato, Minn., for the last fifteen years, as general sales manager of the Middle West and Eastern territory. Mr. Burton has been connected with the same company, as district sales manager of the Middle West territory, for the last eleven years. Mr. Morton has also been connected with the Carney Cement Co. as district sales manager for St. Louis territory for the last eight years. Mr. Hahn is senior member of the law firm of Mooney, Hahn, Loeser and Keough, Cleveland. Mr. Sunshine is a capitalist, of Cleveland. Mr. Cohen is president of M. Cohen and Sons (iron and steel), Cleveland. Mr. Hays is a capitalist, of Cleveland.

Andrew J. Snyder, who has been operating a plant on the property, will be general superintendent and works manager; Ernest E. Berger, formerly with the U. S. Bureau of Standards, at Washington, D. C., and later with the U. S. Bureau of Mines, New Brunswick, N. J., has been employed as chief chemist.

A Historic Past

A bit of interest in connection with the old Rosendale cement industry is that cement rock has been mined and natural cement produced from the Snyder property, which comprises a good portion of the acreage controlled by the new corporation, since 1830. Jacob L. Snyder, great grandfather of Andrew J. Snyder, commenced in a small way about 1825. Andrew J. Snyder first extensively manufactured cement in 1850, continuing until 1910, at which time, the present Mr. Snyder acquired the entire property and discontinued the old plant. However, he erected at that time a more modern mill, which has been operated until the present time.

Mr. Burton states that Rosendale cement has been used on many old and important construction in this country. At one time it was the standard American cement, by which all others were measured. It is of particular interest that cement from the old plant was used in the construction of the Brooklyn bridge, as well as the Delaware and Hudson canal.

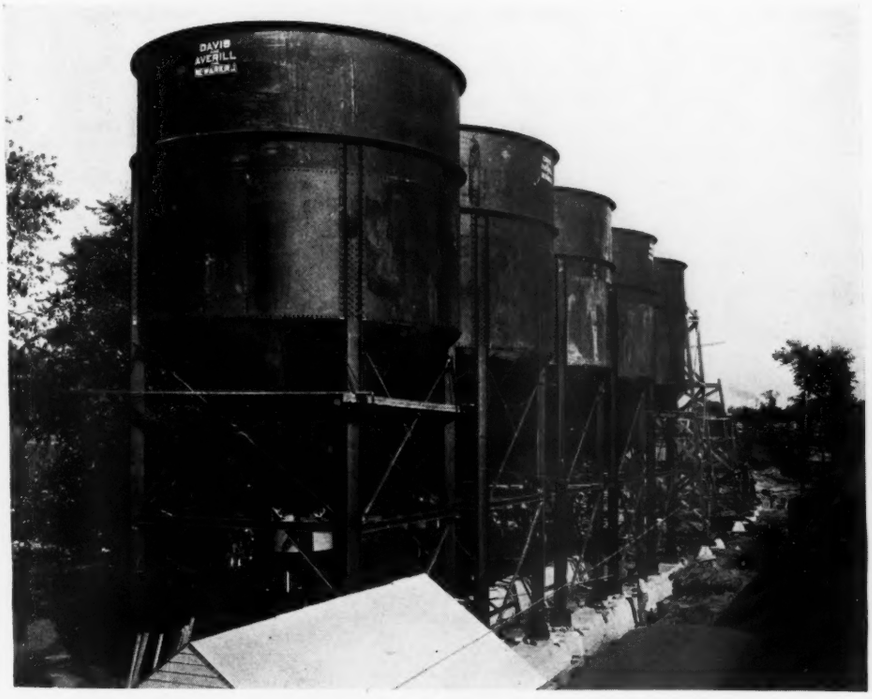
On visits to the districts where this cement was used he saw many surprising evidences of its strength and durability, which were all the more remarkable when the crude manufacturing methods of years ago are remembered. He saws some in the form of stucco on a mill building which was at least 40 years old, which was as sound and hard as a dollar, without the slightest evidence of distintegration, cracking or crazing.

Massaponax Sand and Gravel Corporation Erects New Handling Plant

THE Massaponax Sand and Gravel Corp. of Fredericksburg, Va., has recently completed a new loading and handling plant in Washington, D. C., to supply material for the local retail trade. Davis and Averill, Inc., of Newark, N. J., engineers and contractors for the sand, gravel, crushed stone and affiliated industries, designed the new plant and furnished and erected the steel work. As the plant is situated within the city limits, with small available yard space, special considerations were necessary in perfecting the installation so as to operate at minimum cost under highest efficiency.

The plant consists of five circular steel bins, with supporting columns and bracing. Each bin has a capacity of 400 tons, making a total rating of 2000 tons of sand and gravel for the installation. The material is delivered from the pits in cars, and is dumped into hoppers directly from the cars. From the track hoppers it is elevated to the top of the bin units by means of a belt conveyor. Here it is distributed to the different bins, as desired, by means of a tripper device. The entire operation is simple, speedy and effective.

Owing to the limited yard space mentioned, the bins are arranged in series. A drive-way is provided beneath the bin units, between the steel supports. The delivery trucks travel on this driveway, entering at one end, stopping only a few minutes to receive their full load, and passing out under the bins at the other end. The bottom of the bins are equipped with gates and measuring hoppers, allowing for the material to be shipped either in truck load or batched, as the condition may require.



New material handling plant of the Massaponax Sand and Gravel Co. in Washington, D. C.

Iowa Worried About Its Future Gravel Supply

VARIOUS Iowa newspapers are commenting on the diminishing sand and gravel supply throughout considerable portions of the state. The following, an editorial in the *Muscatine Journal*, is fairly typical:

"It has been pointed out by the good roads association of the state that much of the state's good gravel is going on primary roads which will eventually be paved, and that instead of the gravel being used there it should be saved for and applied on the secondary road systems, where it will always be a sufficient surfacing.

"Without question that is true. In this county, for instance, the county has exhausted an enormous gravel bed in order to surface primary roads. These roads are certainly going to be paved in the near future, if not under our county plan under a state plan. In the meantime there are many miles of county and township roads which should be surfaced with gravel, but when we attempt to do it, as we shall, there'll be no adequate gravel supply at hand for the purpose.

"Moreover, the maintenance on the main traveled roads is so great that more and more gravel must be used there. All of this is taking away a source of surfacing which the secondary system will need, but which it will not be able to get except at much higher cost.

"The alternative, of course, is paving those roads where the traffic is now such that it is economy to do so. We can do that under the proposed state bond issue and when it is done the gravel supply within the state can be conserved for use on the secondary road systems. This may not seem much of a problem to the average individual, but any county engineer or state maintenance man can tell you that it is a vital factor in road building and surfacing cost."

Kansas Gravel Producer Wins Court Decision on Value of His Deposit

FINDING in favor of John Ferriter, Justice Burch of the Kansas state supreme court, in about so many words, said the value of the sand pit at Nineteenth and Little River, Wichita, which was taken from him by the city through condemnation proceedings, is worth $82,500.

The case has been tried twice in the district court. One jury valued the property at $8800 and the second at $14,400. It had been appraised at $7000 and Mr. Ferriter had filed suit for $100,000, claiming that to be its actual value.

The supreme court decision was an upholding of the decision of Judge I. N. Williams that the judgment was not sufficient. The case will now be retried unless the city should decide to settle out of court.

The 5½-acre tract was condemned in connection with the city's million dollar flood prevention program.

Justice Burch called special attention to the fact that the last jury found there was 50,000 cu. yd. of sand and gravel in the pit. He said this finding had no evidence to support it.

He called attention to the scientific measurements made by the county engineer and county surveyor, which the justice declared was undisputed. "The bored tests found the deposit to be 29 ft. and by actual mathematical calculation determined the tract contained 340,000 cu. yd. of sand and gravel," Justice Burch continued in his written opinion.

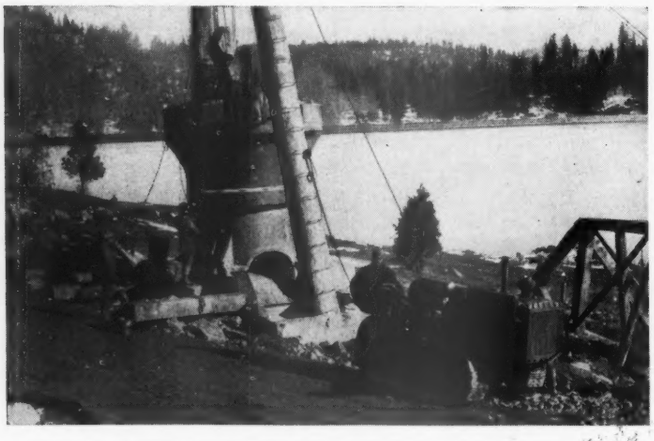
"And a jury found the value of sand at that time was 25 cents a cubic yard," it was added.

"The question was, What was the value of the land? Testimony substantiated the fact the land was worth practically nothing except for the sand and gravel. So if the quantity of the sand and gravel is great, then the land is valuable. The law requires the land owner to be compensated. Rules for the ascertainment of damages must be adapted to fulfillment of the purposes of the law," the justice continued. — *Wichita* (Kan.) *Beacon.*

Hints and Helps for Superintendents

Dismantling a Gyratory Crusher with a Tractor

THERE are many odd jobs around a rock products plant which may be easily performed if just the right method is found. An instance of this is shown in the accompanying illustration taken at the Shaver dam of the Southern California Edison Co. Here a 30-in. gyratory rock crusher had been set up to prepare stone for the construction work at the dam, and it was no little portable crusher either, but an outfit bigger than is found in many crushing plants. When the time came to dismantle the crusher, the different parts were taken out by means of a block and tackle attached to an A-frame of heavy timbers set up over the crusher. Power for operating the block and tackle was supplied by a "Caterpillar" tractor, model 30, equipped with a hoist. The use of the tractor for this work saved bringing in a lot of expensive hoisting equipment for the job.



A caterpillar tractor finds many uses in the rock products industry

Leaking Kettle Gates

FOR some reason or other, the mechanical niceties that are used in connection with most plaster making equipment are usually overlooked entirely when it comes to the design and construction of the kettle gate. The basal structure of the gate is not open to criticism so much, as it is usually a well-designed heavy casting and is properly machined. But the gate itself—any old piece of ¼-in. boiler plate is lopped off with a torch and used as a gate. The pressure exerted against this gate is sufficient to create a binding action, causing the gate to stick, and this feature, coupled with its rough construction, usually makes it necessary to have it installed loose in the guides, since otherwise the kettleman cannot open the gate quickly, which is necessary. With the gate installed loosely there is bound to be some leakage, and the amount of leakage is not easily defined, as it may be a few pounds or it may be a few tons. No one is there to tell how much leakage is present and if there were the dust conditions are usually such that he could not make an estimate. (If the writer could bring this to the attention of the manufacturers of plaster equipment and they would develop a non-leaking gate that could be easily opened while the kettle was hot or cold, then ROCK PRODUCTS would feel that they had done at least one little service during 1928).

However, to get around the present handicap, at the Ludwig, Nev., plant of the Standard Gypsum Co. this gate-leaking condition was overcome by installing a second gate a few inches behind and below the original gate, and each kettle cycle filling the in-between space with cold stucco. This stopped all leakage of plaster to the hot pits.

The apron of old rails broken from rock impact

Anchoring a dust cap as shown at Hawk Lake, Ont.

A Stitch in Time

"A STITCH in time may save nine," is an old saying, and the accompanying picture shows how the Grenville Stone Co., at Hawk Lake, Ont., took one stitch that may save a valuable crusher. Rock that can break 100-lb. steel rails which were in place less than two weeks, as one of the cuts shows, is apt to send the crusher dust cap down into the body of the crusher at any time, so they are not taking any chances, but are anchoring the crusher dust cap to the building as shown.

Simple Daily Production Cost Report

A MANAGER of any operation should know what his costs are and the quicker he knows them the better. There is nothing very interesting about a cost statement that is a month old or is so complicated that it requires an excessive amount of thought to unravel the information therein contained, but a cost statement that is on the desk at the opening of the business day, that is simple and that shows to a few cents what the operating cost was for the day previous, is interesting, valuable and unquestionably helpful.

The daily quarry report and cost statement of the Casper Stolle Quarry and Contracting Co., Stolle, Ill., meets all these requirements. The blank, a copy of which is shown here, is filled out daily by the different departments and shows the total cost of the previous day's operation.

DAILY QUARRY REPORT

STOLLE, ILL.,_____192___

THE CASPER STOLLE QUARRY AND CONTRACTING COMPANY

President			
Secretary			
Office Clerks			
Foreman			
Night Watchman			
Electrician			
Oiler			
Hoistman			
Crusher Feeders			
Blacksmith & Helper			
Stableman			
Well Driller (Ft. Drilled) No. 1 & Helper			
Well Driller (Ft. Drilled) No. 2 & Helper			
Jigger Runners			
Tram Car Repairer			
Dinkey Engineer & Skinner			
Drivers			
Powder Man			
Day Laborers			
Carpenters			
Electric Shovel Crew No. 1			
Steam Shovel " No. 2			
Erie Shovel Crew			
Stripping			
Mechanics			
Total Pay for Day			
Powder			
Electricity			
Coal			
Oil			
Insurance			
Gen'l Expense Estimated			
Total Exp. and Pay Roll for Day			
Total Expense to Date			
Total Pay Roll to Date			
Total Exp. and Pay Roll to Date			

Operated	Hours	Delayed	Hours
" Pulverizer "			
Cause of Delay			
No. 8	Tram Cars Crushed		Tons
No. 6	" " "		Tons
Average Cost per ton	Total		Tons
Tonnage to Date Brought Forward			
Total for Month to Date			Tons
Total for Year to Date			Tons

SHIPPING ACCOUNT

Bro't Ford	lbs.		Cars	Tons
Shipped	"		"	"
Total for Mo.	"		"	"
Total for Yr	"		"	"

TRUCK ACCOUNT

Bro't Ford.	lbs.		Trucks	Tons
Shipped	"		"	"
Total for Mo	"		"	"
Total for Yr	"		"	"

RAILROAD CAR ACCOUNT

	Ballast Cars		Side Dump Cars		Coal Cars		Flat Cars		Box Cars	
	No.	Net Wt	No.	Net Wt.	No.	Net Wt.	No.	Net Wt.	No.	Net Wt
Ordered										
Received										
Shipped										
On Hand										

GROUND STORAGE ACCOUNT

	Cars	2½ in.	Tons	Cars	1½ in.	Tons	Cars	¾ in.	Tons
Ford.									
Total									
Taken From									

REMARKS

Daily costs are obtained quickly by means of this report

Splicing Manila Line to Wire Rope

THIS SPLICE, SO-CALLED, is practically a friction splice, and depends upon the pressure of the strands of the fiber rope to hold the wire rope in place. The wire rope is in the same position in the cable as the heart or core in a four-strand rope.

The first operation is to put the wire rope into proper condition to be run into the drilling cable and to hold securely when in place, viz., to taper the end of the wire line. This taper must be at least 8 ft. in length. Put strong seizing on wire rope 8 ft. from end; unlay strands and taper by cutting out wires.

Eight feet of rope will give you approximately 8 ft. of strand, plus 10%; 8 ft. = 96 in. plus 10% is approximately 106 in. If you have a wire rope 6x19, you will have to cut out 18 wires, leaving one wire. In cutting these wires equalize the distance so as to leave a true taper. If you are careful, you can do this without losing the shape of the strand completely, and this will enable you to lay the strands together leaving the end of the wire rope with a true taper.

Put two strong seizings on and cover with electrician tape the full length. Cover carefully, leaving no ends of wire protruding to cut the fiber.

Put a seizing around the Manila drilling cable about 6 ft. from the end. With a marlin spike raise one strand of the cable and insert the tapered end of the wire line, pulling through 7 ft. of the wire. Now insert the spike under the strand and over the wire and revolve the spike around the cable, following the outline of the cable. This will force the wire into the center of the cable, forming a core. In the oil fields they use a piece of iron pipe 4 ft. long by ½-in. dia. with a dent in the center to hold the wire rope. This pipe is inserted under the strands after it is raised by the spike. Now put whipping on where you have started to roll in the wire and another on the end of the cable and roll the wire rope toward the end in the same manner as you have rolled in the tapered end. When this is complete, the wire rope is in the same position as the core in a four-strand rope, and the greater the strain, the tighter the grip of the cable strands on the wire. Put a strong whipping about 3 ft. from the cable end. Unlay the Manila cable, take the strands and lay around the wire and serve the taper with tarred or Manila yarns. If this wears off, renew from time to time and carefully watch all servings and renew if necessary, as the strength of the splice depends entirely upon the friction of the strands in the rope.—*Plymouth Products*, published by the Plymouth Cordage Co., Plymouth, Mass.

Ground Storage Pile with Hopper Bottoms

WHEN Dolomite, Inc., of Cleveland, Ohio, took over the operation of the Sturgeon Bay Co. plant at Sturgeon Bay, Wis., the previous operators had built outdoor storage piles with reclaiming belts running in tunnels beneath. This system is still in use, but many changes are being made at the primary and secondary crushing end and eventually the whole stockpile building equipment as well as the reclaiming machinery will be replaced.

The materials that made up the base of the stockpile became mixed with some off-sized rock and even though the pile was drawn as low as the live flow of material would permit, before refilling from the storage building conveyors, occasional large pieces of stone would work up into the sized material, which ultimately gave rise to a complaint.

In a desire to have a high quality material at all times instead of a badly graded product, even though there might be only a few off-sized pieces of rock in a boatload of material, the management conceived the idea of drawing the stockpiles down as low as conveniently possible and of building a concrete hopper out of the remaining bed of material. This was accomplished by "Guniting," or spraying the hopper-shaped depression with a portland cement grout by means of a cement gun supplied by the Cement Gun Co. of Allentown, Penn. This construction method cheaply and effectively provided a means of building a concrete lined hopper without seriously interferring with regular operations and prevented any contamination of the graded rock produced in subsequent operations.

Pennsylvania - Dixie Celebrates Safety Record with Barbecue

THE PENNSYLVANIA-DIXIE CEMENT CORP. staged a big community barbecue October 24. Twelve hundred pounds of pork and veal were prepared under the direction of Sam Brannon of the Richard City, Tenn., plant, and all the "extras" were served at the same time.

Fourteen hundred people were fed, which includes all employes of the company's local plant, the Chattanooga office force and friends from South Pittsburgh and Marion county.

This is in the nature of a celebration for the unusual safety record of the local plant under the direction of J. F. Ulhman. White employes have not had a single lost-time accident during the entire year 1928. The company is very hopeful of bringing one of the Portland Cement Association's safety trophies to the south this year.

There is a splendid spirit of co-operation between the company and employes which has helped to bring about this good record.—*Chattanooga* (Tenn.) *News.*

Controversy Over Use of Imported Cement in Philadelphia Is Warm

PHILADELPHIA, PENN., NEWSPAPERS for the past three weeks have contained many columns of charges and countercharges over the use of imported British and Belgian cement in city paving work. The fight against imported cement is being led by Morris Wolf, counsel for the Cement Information Bureau, an association of eastern portland cement manufacturers. Mr. Wolf is quoted as having stated:

"I note that Assistant Controller Wilson announces that it is the purpose of the inquiry to probe the membership and activities of the Cement Information Bureau. We welcome such an inquiry and will be glad to lay all our cards on the table. We will give the names of the companies comprising it and of all the representatives in this city of these companies. We will ask that the same light shall be shed upon all representatives, political and otherwise, of the foreign cement companies that are being favored in city contracts."

Among the matters to be investigated are allegations that contractors doing business with the city involving the use of cement have been told that they will find their road smoothed for them if they used the favored foreign cements.

Much of the controversy concerns the use of "Ferrocrete," an English quick-hardening cement, which it is said is not up to the city of Philadelphia's specifications, which are:

"'Fast-Hardening Portland Cement.' It shall conform to all the requirements, including physical and chemical, of portland cement as defined in these specifications, except in tensile strength, which when tested in the usual manner (1-3 Ottawa sand) shall show results of not less than the following:

One day in water	300 lb. per sq. in.
One day in moist air, six days in water	450 lb. per sq. in.

And final set which shall be attained in five hours."

It was charged that the British manufacturer has gained preference in city work through its connection with Edward J. Cook, republican leader of the Eighth Ward, reported to be the Philadelphia representative of the British firm. It is further charged by American cement firms that the Bureau of Highways asked bids on specifications that no cement manufacturer could meet, and when the American firms declined to bid on the job the contracts were awarded to the British firm.

The upshot of the protest came on October 23, when Director of Public Works Murdock promised to have the specification changed. At a hearing before Deputy Controller S. Davis Wilson as referee he ruled that the American portland cement manufacturers' claim that the specifications were so drawn that American manufacturers could not meet them gave no legal ground for a battle except that the imported cement could not meet the specifications either, although it is being used.

These specifications, Attorney Wolfe pointed out at the close of the hearing, require the cement to show a tensile strength of 300 lb. per sq. in. after 24 hours. It is his contention that the British cement will not show half of that, but that special brands of American cement of the quick-hardening variety would show up infinitely better than the British material.

Director of Public Works Murdoch disputed this point, but said he was willing to confer with the cement experts. His interest, he pointed out, was in getting the best possible cement for the money.

The imported material, coming in duty free under the present tariff schedules, costs nearly twice as much as ordinary American portland cement, but its price is less, it is said, than the two available brands of American quick-hardening cement.

This material is used when traffic conditions make it essential to complete work in the shortest possible time. Because of its hardening properties the time of a job can be cut in half.

Cement manufacturers claimed that the use of the quick-hardening cement is a tremendous waste of money on many of Philadelphia's jobs because work is left open so long after the cement is poured that regular cement could have been used as well and a stronger and better job done for less money through the use of more domestic cement in a given quantity of concrete.

Operation of Quarries in City of St. Louis, Mo., in Controversy

THE St. Louis Court of Appeals is reviewing the appeal of Roger Davison, owner and operator of a stone quarry in the southwest section of St. Louis, Mo., from a $500 fine assessed against him by Provisional Judge Philipson in City Court No. 1 for violating a city ordinance prohibiting the operation of a quarry within 300 ft. of an inhabitated building or public meeting place.

Pending the review of his case by the court, Mr. Davison has been released from jail on a writ of habeas corpus.

Mr. Davison was arrested June 29 for operating his stone quarry between Drury lane and Wellington, Manhattan and Lemington avenues in alleged violation of a city ordinance. He was fined $500 by Judge Phillipson on the charge, but appealed to the Court of Criminal Correction asking the fine be dismissed on the ground the ordinance was unconstitutional and unreasonable. He was released on $1000 bond pending a decision by the higher court.

Later the court ruled against Mr. Davison's contention and sustained the fine. When the quarry operator surrendered on his surety he was taken in custody by the sheriff, who held him under arrest until his attorney, William Lucas, obtained a writ of habeas corpus for his release.

Mr. Lucas recently said the whole proceedings is in the nature of a test case to test the ordinance, which he declares is unconstitutional and unreasonable and deprives the owner of the use of his property.—*St. Louis* (Mo.) *Globe-Democrat.*

Allentown Paper Runs Special Keystone Cement Issue

ON October 22, a short time after the new Keystone Portland Cement Co. plant at Bath, Penn., was formally placed in operation, the *Allentown* (Penn.) *Leader* ran a special edition featuring the new plant and detailing many of its features of construction. This additional section of the paper was of full newspaper size and contained 16 pages. A full description of the plant, well illustrated, was included, and a long article on the "Polysius Method of Making Cement" was also given. The Keystone plant is equipped with Polysius machinery, and uses the Polysius process, as detailed in the description of the plant in Rock Products for October 13, 1928. The Polysius Corp., while of German origin, is established at Bethlehem, Penn., and will soon manufacture all of its machinery in this country. This featuring of the new mill indicates the greatest importance placed on it in the Lehigh Valley district where the city of Allentown is one of the centers of this cement producing region.

Editorial Comment

As this issue of ROCK PRODUCTS goes to the printer it appears that Herbert Hoover is nearly unanimously elected President of the United States. We believe his election amounts to the beginning of a new epoch in American business and industry. No other President ever had anywhere near the business and industrial experience of Mr. Hoover. No other American today probably understands business and industry and all its intricate problems as does Mr. Hoover. No other American has done more to promote business and industry, or has done more to promote confidence and integrity in business men; and he has demonstrated time and again his own confidence in the integrity and good faith of business and industrial leaders, and in their ability to solve the problems of their particular business and industry in their own way.

A Great Responsibility

In assuming his office as President of the United States he will assume the heaviest responsibilities any man in the world can assume. At the same time all American business men and leaders in industry will assume large responsibilities, for under Mr. Hoover's administration they may, from past experience, expect the fullest latitude in dealing with the problems of industry and business. But they may be sure that Mr. Hoover will have no patience with men who are unable or unwilling to solve their problems with the public welfare always the prime consideration.

If business men and industrial leaders grasp the opportunity offered them for self-government through their trade, industrial and professional associations, and assume the responsibility of acting in entire good faith with one another and with the public, even as Mr. Hoover will act with them and with the public, we shall see a new epoch in American government and industry and an era of prosperity, in all probability, unparalleled in our national history.

Incidentally, Mr. Hoover is by no means unfamiliar with our own rock products industry. He is a mining engineer, and as such has followed closely and with genuine interest the remarkable rise in economic importance of the nonmetallic mineral industry. Moreover, he himself has operated cement plants (in China).

Most American men between 21 and 60 years give far more of themselves to business and industry than to any other activity. Yet most successful business men have some kind of a hobby for diversion and amusement. Golf is perhaps the most popular, and a good one because it takes its enthusiasts into the open. But before we had golf there were other forms of amusement, diversion or recreation quite as healthful and satisfactory. One was nature study. Some went in for birds, others trees, plants, astronomy or what not. Not the least interesting to those who love and study nature is geology and mineralogy. Such nature study has not been much in evidence among business and professional men in recent years, but we are glad to see some evidence of its revival.

Making Your Business Enjoyable

There has recently been organized, with the secretary's office at Peekskill, N. Y., the Rock and Minerals Association, the primary object of which is "to stimulate public interest in geology and mineralogy and to endeavor to have courses in these subjects introduced in the curricula of the public schools; to revive a general interest in minerals and mineral collecting, to instruct beginners as to how a collection can be made and cared for; to keep an accurate permanent record of all mineral localities and minerals found there and to print this record for distribution; to encourage the search for new minerals not as yet discovered."

Surely all these objects rock products operators can subscribe to. The association is yet too young to have established much of a program, or to have organized sufficiently to carry out many of its objects; but the nucleus of a very helpful and interesting association is there; it will be what its interested members make it. The membership cost is very nominal ($1.25 per year) and includes a monthly bulletin.

This association, of which we confess we know little at the present moment, very much appeals to us, and we have sent in our membership. It appeals to us as an opportunity to renew the slight knowledge of geology and mineralogy acquired during school days, and the extensive acquaintance with these sciences since acquired, but rather unorganized in the mind. To us, and we believe to many whose primary business interests are in the rock products industry, we believe there is an opportunity here for a fascinating and helpful diversion from routine work.

Such an eminent leader in the rock products industry as the late John J. Sloan, past-president of the National Crushed Stone Association, was well versed in geology, particularly in the geology of those formations where his gravel pits and quarries were located, and his office in Chicago contained an interesting collection of rocks and minerals from many localities. Whoever operates a quarry has a peculiar opportunity to make contributions to our knowledge of geology and mineralogy. And any operator, be he foreman, superintendent or owner, will find that there is no greater joy than the knowledge or belief that he is adding his contribution to the world's fund of knowledge about the world itself.

Financial News and Comment

RECENT QUOTATIONS ON SECURITIES IN ROCK PRODUCTS CORPORATIONS

Stock	Date	Bid	Asked	Dividend
Allentown P. C. com.[37]	12-30-27	3	7	
Allentown P. C. 1st 6's[29]	11- 7-28	90	.....	
Alpha P. C. new com.	11- 5-28	44	46	75c qu. Oct. 15
Alpha P. C. pfd.[2]	11- 5-28	116	.....	
Amer. Aggregate 6's, bonds	11- 8-28	106½	107½	
American Brick Co.	11- 5-28	17½	18	25c qu. Nov. 1
American Brick Co. pfd.	11- 5-28	91	94	50c qu. Nov. 1
Am. L. & S. 1st 7's[29]	11- 7-28	100	102	
American Silica Corp. 6½'s	11- 7-28	96	100	
Arundel Corp. new com.	11- 7-28	38¾	39	50c qu. Oct. 1
Atlantic Gyp. Prod. (1st 6's & 10 sh. com.)[10]	11- 7-28	105	108	
	11- 7-28	105	108	
Atlas P. C. com.	11- 5-28	39	41	50c qu. Sept. 1
Atlas P. C. pfd.	11- 5-28	47	49	66⅔c qu. July 2
Beaver P. C. 1st 7's[20]	11- 1-28	97	100	
Bessemer L. & C. Class A[4]	11- 7-28	36½	37	75c qu. Nov. 1
Bessemer L. & C. 1st 6½'s[24]	11- 5-28	100½	101¼	
Bloomington Limestone 6's[29]	11- 7-28	94	96	
Boston S. & G. com.[16]	11- 2-28	77	83	$1 qu. July 2
Boston S. & G. 7% pfd.[16]	11- 2-28	83	86	1¾% qu. July 2
Boston S. & G. Co. 1st pfd.[16]	11- 2-28	93	95	2% qu. July 2
Canada Cem. com.[43]	11- 5-28	27	.....	
Canada Cement pfd.[43]	11- 5-28	98	98½	1.62½ qu. Sept. 30
Canada Cement 5½'s	11- 3-28	101¼	102¼	
Canada Cr. St. Corp. 1st 6½'s	11- 3-28	97	98	
Canada Gyp. & Alabastine	11- 5-28	.....	75	75c Oct. 1
Certainteed Prod. com.	11- 5-28	31	31½	$1 qu. Oct. 1
Certainteed Prod. pfd.	11- 5-28	80	90	1.75 qu. Oct. 1
Cleveland Stone new st'k	11- 7-28	55	60	50c qu. Sept. 1 & 25c ex.
Columbia S. & G. pfd.	10-23-28	91⅝	92	
Consol. Cement 1st 6½'s, A[42]	11- 7-28	94	99	
Consol. Cement 6½ notes[29]	11- 7-28	.....	93	
Consol. Cement pfd.	11- 7-28	50	60	
Consol. S. & G. com. (Canada)	11- 5-28	17	18	
Consol. S. & G. pfd. (Canada)	11- 5-28	88	90	
Consumers Rock & Gravel, 1st Mtg. 6's, 1948	11- 2-28	98	99½	
Coosa P. C. 1st 6's[29]	11- 7-28	55	.....	
Coplay Cem. Mfg. 1st 6's[40]	11- 5-28	90	.....	ai
Coplay Cem. Mfg. com.[40]	11- 5-28	15	.....	
Coplay Cem. Mfg. pfd.[40]	11- 5-28	75	.....	
Dewey P. C. 6's[30]	11- 7-28	99	102	
Dolese & Shepard[7]	11- 7-28	128	132	$2 qu. Oct. 1; $1 ex. Oct. 1
Edison P. C. com.[19]	10-19-28	25c	.....	
Edison P. C. pfd.[19]	10-19-28	1	.....	
Edison P. C. bonds[19]	11- 2-28	65	75	
Fredonia P. C. 1st 6½'s[32]	12-28-27	97	101	
Giant P. C. com.	11- 5-28	25	30	
Giant P. C. pfd.	11- 5-28	32	38	3½% June 15
Ideal Cement, new com.	11- 7-28	83	85	75c Oct. 1
Ideal Cement 5's, 1943	11- 3-28	107	109	
Indiana Limestone 6's	11- 5-28	89	89½	
International Cem. com.	11- 5-28	77¼	77½	$1 qu. Sept. 28
International Cem. bonds 5's	11- 5-28	100¾	101¼	Semi-ann. int. payable June 15
Iron City S. & G. bonds 6's[40]	11- 5-28	97	99	
Kelley Is. L. & T. new st'k	11- 7-28	56	59	62½c qu. Oct. 1
Ky. Cons. Stone Co. com.[46]	11- 1-28	13	15	
Ky. Cons. St. com. Voting Trust Certif.[46]	11- 1-28	13	15	
Ky. Cons. Stone 6½'s[46]	11- 1-28	97	100	
Ky. Cons. St. Trustee Certif.[46] (1 sh. 7% cum. pfd. & 1 sh. com. stock)	11- 1-28	99	101	$1.75 Aug. 1
Keystone Sand & Sup. 6's[47]	8-22-28	99	100	
Lawrence P. C.[2]	11- 5-28	96	101	2% qu. Sept. 29
Lehigh P. C.[2]	11- 5-28	44	48	62½c qu. Nov. 1
Lehigh P. C. pfd.[2]	11- 5-28	108	111	1¾% qu. Oct. 1
Lyman-Richey 1st 6's, 1932[13]	11- 2-28	98½	100	
Lyman-Richey 1st 6's, 1935[13]	11- 2-28	97½	99	
Marblehead Lime 1st 7's[14]	11- 2-28	100	.....	
Marbleh'd Lime 5½'s, notes[14]	11- 2-28	98½	100	
Material Service Corp. 6's	11- 8-28	99	100	
Mich. L. & C. com.[6]	11- 5-28	35	.....	
Missouri P. C.	11- 7-28	44	44½	50c qu. Aug. 1
Monolith Midwest[9]	11- 1-28	8	10	
Monolith P. C. com.[9]	11- 1-28	13¾	14¼	8% ann. Jan. 2
Monolith P. C. pfd.[9]	11- 2-28	.....	9¼	
Monolith P. C. units[9]	11- 1-28	31¾	33¼	
National Cement 1st 7's[33]	11- 5-28	99	101	
National Gypsum A com.[35]	11- 7-28	13	15	
National Gypsum pfd.[35]	11- 7-28	50	55	1¾% qu. Apr. 1
Nazareth Cem. com.	10-20-28	28¾	32	75c qu. Apr. 1
Nazareth Cem. pfd.	10-20-28	100	.....	
Newaygo P. C.[1]	12-30-27	115	.....	
Newaygo P. C. 1st 6½'s[29]	11- 7-28	101	.....	
New Eng. Lime pfd., A[41]	10- 6-28	.....	90	
New Eng. Lime pfd., B	11- 2-28	97	99	
New Eng. Lime com.	11- 2-28	25	30	
New Eng. Lime 1st 6's[14]	11- 2-28	98	100	
N. Y. Trap Rock 1st 6's	11- 7-28	100½	100½	
North Amer. Cem. 1st 6½'s	11- 5-28	72⅛	72¾	
North Amer. Cem. com.	11- 7-28	6⅛	7	
North Amer. Cem. 7% pfd.	11- 2-28	25	35	$1.75 qu. Aug. 1
North Amer. Cem. units	11- 2-28	30	40	
North Shore Mat. 1st 5's[15]	11- 7-28	98½	.....	
Northwestern States P. C.[37]	11- 3-28	195	205	
Pac. Coast Cem. 6's, A	11- 2-28	96¼	98½	
Pacific P. C. com.	11- 2-28	19	22	
Pacific P. C. pfd.	11- 2-28	76	77	1.62½ qu. Apr. 1
Pacific P. C. 6's	11- 2-28	98½	100¾	
Peerless Egyp'n P. C. com.[21]	11- 2-28	1½	2½	
Peerless Egyp'n P. C. pfd.[21]	11- 2-28	75	90	1¾% qu. July 1
Penn-Dixie Cem. 1st 6's[28]	11- 7-28	98	98½	
Penn-Dixie Cem. pfd.[28]	11- 7-28	83	85	1.75 qu. Sept. 15
Penn-Dixie Cem. com.	11- 7-28	19½	19⅞	50c qu. July 1
Penn. Glass Sand Corp. 1st 6's, 1952	10- 3-28	102½	103¼	
Penn. Glass Sand pfd.	10- 3-28	110	.....	
Petoskey P. C.	11- 7-28	10	11	1½% qu.
Riverside P. C. com.	11- 2-28	20	.....	
Riverside P. C. 1st pfd.	11- 1-28	93	95	1.50 Aug. 1
Riverside P. C., A	11- 2-28	18	21	31¼c cum. part. Aug. 1
Riverside P. C., B	11- 1-28	1	.....	
Rockland-Rockport Lime 1st pfd.[10]	5-17-28	.....	100	3½% s.a. Feb. 1
Rockland-Rockport Lime 2nd pfd.[10]	5-17-28	.....	60	3% s.a. Feb. 1
Rockland-Rockport Lime com.[10]		no market		1½% qu. Nov. 2
Sandusky Cem.	11- 7-28	.....	230	$2 qu. July 2
Santa Cruz P. C. bonds	11- 2-28	105¾	.....	6% annual
Santa Cruz P. C. com.	11- 2-28	90	92	$1 qu. Oct. 1
Schumacher Wallboard com.	11- 2-28	.....	17	50c May 15
Schumacher Wallboard pfd.	11- 2-28	.....	26	
Southwestern P. C. units[44]	11- 1-28	270	.....	
Superior P. C., A[20]	11- 1-28	47½	48	27½c mo. Aug. 1
Superior P. C., B[20]	11- 1-28	35	36	
Trinity P. C. units[37]	11- 3-28	156	162	
Trinity P. C. com.[37]	11- 3-28	52	.....	
U. S. Gypsum com.	11- 7-28	64	64⅜	2% qu. Sept. 30
U. S. Gypsum, pfd. pt. certif.	11- 7-28	43	.....	
U. S. Gypsum pfd.	11- 7-28	125	.....	1¾% qu. Sept. 30
Universal G. & L. com.[8]	11- 7-28	.....	1	
Universal G. & L. pfd.[8]	11- 7-28	.....	10	1½% Feb. 15
Universal G. & L., V.T.C.	11- 7-28	no market		
Universal G. & L. 1st 6's[8]	11- 7-28	.....	60	
Vulcanite P. C. 1st 7½'s[32]	12- 5-27	105	109	
Chas. Warner com.	11- 5-28	35	.....	50c qu. Oct. 10 & 25c ex.
Chas. Warner pfd.	11- 5-28	109	.....	1¾% qu. Oct. 25
Whitehall Cem. Mfg. com.[26]	11- 2-28	150	.....	
Whitehall Cem. Mfg. pfd.[26]	11- 2-28	98	.....	
Wisconsin L. & C. 1st 6's[15]	11- 7-28	100	.....	
Wolverine P. C. com.	11- 7-28	5½	.....	15c qu. Nov. 15
Yosemite P. C., A com.[20]	11- 1-28	4½	5	

[1]Quotations by Watling, Lerchen & Hayes Co., Detroit, Mich. [2]Quotations by Bristol & Willet, New York. [3]Quotations by Rogers, Tracy Co., Chicago. [4]Quotations by Butler, Beading & Co., Youngstown, Ohio. [5]Quotations by Freeman, Smith & Camp Co., San Francisco, Calif. [6]Quotations by Frederic H. Hatch & Co., New York. [7]Quotations by F. M. Zeiler & Co., Chicago, Ill. [8]Quotations by Ralph Schneeloch Co., Portland, Ore. [9]Quotations by A. E. White Co., San Francisco, Calif. [10]Quotations by Lee Higginson & Co., Boston and Chicago. [13]Nesbit, Thomson & Co., Montreal, Canada. [12]E. B. Merritt & Co., Inc., Bridgeport, Conn. [13]Peters Trust Co., Omaha, Neb. [14]Second Ward Securities Co., Milwaukee, Wis. [15]Central Trust Co. of Illinois, Chicago. [16]J. S. Wilson, Jr., Co., Baltimore, Md. [17]Chas. W. Scranton & Co., New Haven, Conn. [18]Dean, Witter & Co., Los Angeles, Calif. [19]Hoit, Rose & Troster, New York. [20]Quotations by Bond & Goodwin & Tucker, Inc., San Francisco. [21]Baker, Simonds & Co., Inc., Detroit. [22]Pirnie, Simons and Co., Springfield, Mass. [23]Blair & Co., New York and Chicago. [24]A. B. Leach and Co., Inc., Chicago. [25]Richards & Co., Philadelphia, Penn. [26]Hincks Bros. & Co., Bridgeport, Conn. [27]J. G. White and Co., New York. [28]Mitchell-Hutchins Co., Chicago, Ill. [29]National City Co., Chicago, Ill. [30]Chicago Trust Co., Chicago. [31]McIntyre & Co., New York, N. Y. [32]Hepburn & Co., New York. [33]Boettcher & Co., Denver, Colo. [34]Kidder, Peabody & Co., Boston, Mass. [35]Farnum, Winter and Co., Chicago. [36]Hanson and Hanson, New York. [37]S. F. Holzinger & Co., Milwaukee, Wis. [38]McFetrick and Co., Montreal, Que. [39]Tobey and Kirk, New York. [40]Steiner, Rouse and Stroock, New York. [41]Hornblower & Weeks, New York City and Chicago. [42]E. H. Rollins, Chicago, Ill. [43]Jones, Heward & Co., Montreal, Que. [44]Tenney Williams & Co., Inc., Los Angeles, Calif. [46]Stein Bros. & Boyce, Baltimore, Md. [47] Bank of Pittsburgh, Pittsburgh, Pa. [48]E. W. Hays & Co., Louisville, Ky.

INACTIVE ROCK PRODUCTS SECURITIES (Latest Available Quotations)

Stock	Price bid	Price asked
American Brick Co. pref. (sand-lime brick) 16 sh.[6]	par 25	25¾
Benedict Stone Corp. (cast-stone), 50 pfd., 390 com.[3]	$400 for the lot	.....
Benedict Stone Corp. 1st 7's 1934[3]	.....	86
International Portland Cement Co., Ltd., pfd.	30	45
Knickerbocker Lime Co.[4]	105	.....
River Road Sand and Gravel Co.,[9] 200 shares	$21 per share	
Simbroco Stone Co.,[10] 10 sh. pfd., par $50	$10.25 per sh.	
Southern Phosphate Co.[6]	1¼	.....
Vermont Milling Products Co. (slate granules), 22 sh. com. and 12 sh. pfd.[6]	$1 for the lot	.....
Wabash Portland Cement Co.[1]	60	100
Winchester Brick Co., pfd., sand lime brick[5]	10c	.....

[1]Price obtained at auction by Adrian H. Muller & Sons, New York. [3]Price obtained at auction by Weilupp-Bruton and Co., Baltimore, Md. [4]Price obtained at auction by Barnes and Lofland, Philadelphia, on April 4, 1928. [5]Price obtained at auction for lot of 50 shares by R. L. Day and Co., Boston, Mass. [6]Price obtained at auction by Wise, Hobbs and Arnold, Boston, Mass. [8]Auction sales of $1000, Barnes & Lofland, Philadelphia, March 31, 1928. [10]Price at auction, June 6, 1928, R. L. Day & Co., Boston, Mass.

Chicago Sand and Gravel Producer Expands

THE MATERIAL SERVICE CORPORATION, Chicago, Ill., is offering at par through the Foreman Trust and Savings Bank, Chicago, $1,000,000 in secured serial 6% gold bonds, dated October 1, 1928, due serially, principal and semi-annual interest, April 1 and October 1. The bonds are in coupon form in denominations of $1000 for all maturities and $500 and $100 in 1938 maturity only. They are redeemable upon 45 days' notice on or before October 1, 1930, at a premium of 2%, 1¼% between 1930 and 1931; 1½% between 1931 and 1932 and 1% premium thereafter. An additional $500,000 in bonds may be issued for no more than 60% of the fair value or cost (whichever is lower) of newly acquired or constructed property free and clear of all liens.

The following data is from a letter of Henry Crown, president of the Material Service Corporation:

HISTORY—The Material Service Corporation, an Illinois corporation, began business in January, 1919, with an original capital of $10,000 and its net worth on December 31, 1927, was $2,019,236.29 as certified by independent appraisers and accountants. Its net worth as of October 1, 1928, is estimated in excess of $2,700,000.

BUSINESS—The corporation is now one of the largest, if not the largest, dealer in concrete materials in its territory. It owns and operates a stone quarry at LaGrange, on the Indiana Harbor Belt railway, a sand and gravel pit at Carpentersville on the Aurora and Northwestern railway and nine distributing yards strategically located at different points in Chicago and suburbs. The yards are all well equipped with modern material handling devices, switch tracks and two have dock facilities.

PURPOSE—The purpose of this issue is to retire all present purchase money obligations, aggregating $112,500, to provide for additional working capital and principally to develop the corporation's waterway program, which entails the completion of a new sand and gravel plant at Lockport, on the Drainage Canal, output of which will be conveyed, in a self-unloading boat now under construction, to the corporation's two new dock yards in Chicago; the boat is the first of its kind to be constructed to permit access to all Chicago river points without the raising of bridges. Upon completion of the corporation's program, the cost of material, loading, transportation and unloading at its docks will be less than the present railroad freight charges alone.

SECURITY—This issue will be the direct obligation of the Material Service Corporation and, in the opinion of counsel, will be secured by a first mortgage on all property which the company now owns or may hereafter acquire, and will constitute its only funded debt. Giving effect to this financing and the acquisition of certain properties, the balance sheet as of December 31, 1927, shows net tangible assets, applicable to this issue of $3,059,242.29 or more than $3059 for each $1000 bond; net current assets of December 31, 1927, exceed $1,000,000. Net profits for 1928 are estimated at $500,000, which will increase substantially the ratio of net tangible assets and net current assets for each $1000 bond.

This issue will be secured by a first mortgage on properties appraised by the American Appraisal Co. at depreciated values in excess of $1,500,000. The mortgage also includes other properties, not independently appraised, which makes the total value of fixed assets about $1,900,000.

EARNINGS—The average net earnings before federal taxes for the last three years, ending December 31, 1927, as certified by David Himmelblau and Co., certified public accountants, are nearly six times the maximum annual interest charges and for the last five years are 4.3 times the maximum annual interest charges on this issue and excepting the last maturity are 2.3 times the maximum principal and interest requirements on this issue. Indications are that the net earnings for 1928 will be in excess of $500,000 or about 8½ times the maximum interest charges on this issue.

	Net sales	Net profits (before Federal taxes)
1923	$2,143,670.63	$103,999.58
1924	3,214,354.52	116,974.52
1925	4,471,219.38	241,651.67
1926	5,738,417.55	362,261.33
1927	6,938,446.72	475,330.04
1928*	7,663,308.33	500,000.00

*These are the actual gross sales for the first nine months of 1928 and the net profits are estimated for the year.

TRUST AGREEMENT — Under the terms of the trust agreement, the corporation covenants that no dividends will be paid unless the earnings for each of the current two years just passed are more than 1½ times the annual principal and interest requirements for this issue and the principal and interest requirements for the current year have been set aside. The corporation further covenants that insurance be carried to 80% of the insurable value of the property under the mortgage and also that $100,000 insurance on the life of the president and general manager be carried for the benefit of the bondholders. This is in addition to $200,000 insurance policy on the life of its president now being carried for the benefit of the corporation.

MANAGEMENT — The management of the Material Service Corporation has been well and favorably known to us for many years. The men who have been responsible for the success of this corporation will continue in the active management and control.

MATURITIES

Maturity	Amount
October 1, 1929	$ 50,000
October 1, 1930	50,000
October 1, 1931	100,000
October 1, 1932	100,000
October 1, 1933	100,000
October 1, 1934	100,000
October 1, 1935	100,000
October 1, 1936	100,000
October 1, 1937	100,000
October 1, 1938	200,000

International Rock Asphalt Company Stock Offered

DACE AND SCOTT, New Orleans, La., recently offered at $100 per share $500,000 7½% cumulative participation preferred stock par ($100) of the International Rock Asphalt Co.

The total capital is $1,000,000 preferred and 20,000 shares common stock (no par.)

The preferred stock is fully paid and non-assessable. It bears a fixed dividend of 7½% payable semi-annually. A premium of 10% shall be paid upon retirement at par on or after January 1, 1933, together with all unpaid dividends to the holders. The National City Bank, New York City, is the transfer agent.

Company—Organized in Louisiana. Principal objects are the quarrying, crushing and marketing of natural rock asphalt. The company's product is distinguished by the trade name "Interock."

Company's properties are located approximately 15 miles east of the city of Havana, Republic of Cuba. This property has been thoroughly tested and shows a deposit in place of many millions tons of high grade rock asphalt.

Sinking Fund—An annual sinking fund of $50,000 as a minimum will be placed in trust with the Whitney-Central Bank for the purpose of retiring the preferred issue, which sinking fund shall be taken from the profits after the payment of the fixed dividend on the preferred stock.

Dividends—Company pays no dividends on its common stock until after the fixed dividend of 7½% is paid on the preferred stock and not until a minimum of $50,000 annually is deposited in trust for the purpose of retiring the preferred stock at par plus 10% premium; thereafter the holders of the preferred stock will participate equally in all funds applicable for dividends with the holders of the common stock, thus giving to the investors in the preferred stock the security of a preferred issue together with the earning possibilities of a common stock.

Estimated Earnings—A conservative estimate by prominent engineers reveals the following facts and figures as to the operating cost at the quarries based on the production of each 500 tons daily capacity unit.

Salaries and wages for labor	$ 5,000.00 per mo.
Interest, taxes, insurance and depreciation	3,125.00 per mo.
Power	3,900.00 per mo.
Unforeseen expenses	1,000.00 per mo.
Total	$13,025.00
Cost of production of material ready for use	1.50 per ton
Income—	
500 tons per day, 20 days	10,000.00 per mo.
10,000 tons per month	120,000.00 per yr.
Selling price net to company	8.00 per ton
120,000 tons per year at $8 per ton	960,000.00

This financing provides for one 500-ton unit.

Total net annual income	$960,000
Annual dividend and sinking fund requirements on total issue of preferred stock	125,000
Applicable for dividends on preferred and common stcok and reserve	835,000

Bessemer Cement Earnings

THE BESSEMER LIMESTONE AND CEMENT CO. reports net earnings for nine months ended September 30 after all charges, including depletion, depreciation and federal taxes, of $456,112, equal to $9.12 a share on 50,000 Class A shares. The earnings available for interest were equivalent to 5.36 times requirements for the period on $2,442,500 first mortgage gold bonds.

Arundel Corporation Prospects

THE ARUNDEL CORP., Baltimore, Md., reports that business at present is exceedingly good. Executive officers report that they have more business on hand than they wish to handle and that they look for contracts for three and four years instead of the immediate future. Business is on a high plane and bidding for new contracts is without letup. The company is working overtime to complete contracts on hand and optimism is very prevalent throughout the organization.—*Wall Street News* (New York City).

Some Ways to Avoid Electrical Hazards in Mill Practice*

A Discussion of What the Operating Man May Expect from Electricity—and What He Can Avoid

By Willard C. Johnson
Industrial Engineer, Westinghouse Electric & Mfg. Co., San Francisco, Calif.

THE electrical hazards which we desire to avoid might, of course, be either hazards to persons or hazards to equipment. I assume that safety to persons is probably your chief consideration here. However, as in almost every case, one type of hazard involves the other to some degree, and as (even neglecting humane considerations) both involve economic loss, I will not attempt to separate the two.

We have gone so far in the betterment of safety matters in the past few years that I presume that conditions which were commonplace a few years ago could hardly be believed by the younger generation today.

In this state the requirements of the Industrial Accident Commission, and the work of various other agencies promoting safe conditions, have largely standardized what might be considered safe electrical practice.

In the brief time allotted, therefore, I will merely try to point out a few ways of avoiding some very real electrical hazards, which in many cases are likely to escape consideration.

Electricity in the Cement Plant

Considering the average California cement plant, which buys its power from a large central station company, we will start with the transformer substation, and consider a few ways of avoiding hazards as we follow the current on down to the motors which finally utilize it.

The oil circuit breakers which may be installed on the high tension side of the step-down transformer, as well as those on the low tension side, will almost as a matter of course be purchased for the correct current-carrying capacity and voltage. Another very important characteristic (if hazards are to be avoided), and one very much more likely to be overlooked, is breaking capacity. By breaking capacity we refer to the current under specified conditions of voltage and frequency which the circuit breaker will safely interrupt. The present standard of comparison is the so-called 20CO duty cycle, which means, first, the circuit breaker is closed on a short circuit, trips open, and after a two-minute delay is again closed on a short circuit and trips open. Under these conditions the breaker must perform its duty without emitting flame, and at the end of the cycle must be in substantially the same mechanical condition as at the beginning.

To indicate the wide possible variation, circuit breakers are available rated at 400 amperes carrying capacity for installation on

Willard C. Johnson

2500-volt circuits, with breaking capacities of anywhere from 5000 to 40,000 amperes on a 20CO rating basis.

The breaking capacity necessary is determined by the amount of current which can flow in the event of a short circuit, and this is in turn determined by the size of the power system to which you are connected, limited by the length and size of the transmission line serving you, together with the size of your own transformer installation. To give you satisfactory service power systems are ever growing larger, and growing demands of California mills means more installed horsepower and larger transformer banks. Both these factors, therefore, mean that the circuit breaker which was safe yesterday may be a very real hazard tomorrow.

The answer, then, is not to buy a circuit breaker simply on the basis of its ampere carrying capacity and voltage, but to specify the breaking capacity adequate to your needs. Aside from your own, and consulting engineers, the central station companies and the electrical manufacturer can give you helpful advice. And finally give due consideration to growth, which may reasonably be expected.

For installation on the high tension side of small transformers, safety type disconnecting fuse cutouts of adequate breaking capacity are available.

The modern transformer is one of the most reliable pieces of apparatus which we have. However, faults in transformers can occur. If air is in contact with the surface of the oil, it is possible for a fault in the transformer winding to cause an explosion. This hazard is avoided by providing an atmosphere of nitrogen in contact with the oil surface. This we call the "Inertaire Transformer."

Switchboard Hazards

Hazards in connection with switchboards are most likely to be due either to mechanical failure of the material of the board, unguarded switches and conductors, or lack of proper working space around switching equipment.

The introduction of steel as a switchboard material helps to overcome these. Steel switchboards are now supplied which will meet all requirements for good appearance. These structures are not subject to breakage, as is the case with slate or marble. In addition they particularly lend themselves to the proper enclosure of all live parts.

Oil circuit breakers should preferably be mounted apart from switchboard panels, with plenty of working space provided between the panels and breakers.

In many mills where continuous operation is required, the installation of truck type switching equipment will not only avoid

*Paper delivered before Pacific Coast Regional Safety Meeting of the Portland Cement Association, October 2, 1918.

hazards but will save its extra cost in a comparatively short time, due to the elimination of shutdowns. With this type of equipment complete panels with their switching equipment can be withdrawn for repair without causing a shutdown. This reduces the temptation to keep equipment in service without proper maintenance, with its attendant hazards.

On low tension circuits, in California at least, the old open knife switch with its dangers has ceased to exist. The totally enclosed, externally operated switch, which has replaced it, however, may, if proper care has not been taken in its selection, prove to be anything but a safe switch. Here again the question of breaking capacity is an important one. Even when this type of switch is intended for disconnecting purposes only, it is frequently so located that it can be operated by the unskilled workman, who is more than likely to attempt to open it under load. It is possible to obtain switches at no great increase in cost which are capable of safely opening the locked rotor currents drawn by induction motors, thus eliminating the possibility of burned workmen and lost production. Where these switches are operated by non-skilled attendants, the double door switch with a fuse compartment which cannot be opened except with the switch open and all parts dead, is another worthwhile hazard eliminator.

Modern motor control has gone a long way to justify the designation "foolproof." Possibly the most important tendency which makes for reduced hazard is the growing use of push button operated magnet switch control. The development of linestart alternating current motors, that is, which may be started on full line voltage, has simplified and reduced the cost of this type of control and therefore accelerated its use. Where the control must be used by workmen with no electrical knowledge, the operation by push button not only physically removes the workmen from the switching device but insures its correct operation. With the manually operated device the old steam operators' idea that a starter or controller should be "inched into place" is by no means extinct.

Protecting Complex Electrical Equipment

Where magnetic switching equipment of a somewhat complex character is required, we may either totally enclose the control or else leave it open and install it in a separate control room only accessible to the mill electrical force. Where possible, the latter procedure is generally the safer and more desirable. Proper maintenance is a great hazard reducer. Open contactor equipment is much more easily inspected and maintained than the totally enclosed type, and where properly isolated it meets all safety requirements.

One of the big steps in reducing motor burnouts, due to overloads, has been the introduction of the thermal type of overload relay, today largely used on alternating current motor control. This type of device can not only be calibrated very accurately, but will maintain its accuracy. In common with all overload protective devices, however, it must be made adjustable, and unless it is properly set when installed, and the proper setting not tampered with, it is, of course, useless. When an overload device operates it is a sign of trouble (more frequently than not, trouble with the driven machine). The mill which will eliminate the practice of coppering fuses, and blocking out, or oversetting overload devices, will not only eliminate a lot of unnecessary hazards, but in the long run will show a gain in production.

Modern motor design has done much to eliminate hazards, not only by building better equipment, but also in the way of developing special types for particular conditions.

We now have available the "sealed sleeve" bearing, the housing construction being such that no dirt can get in and no oil can get out. This eliminates oil-soaked motor windings and worn bearings, the cause of possibly 80% of motor failures in the past. This, taken together with improved methods of insulation and impregnation of motor windings, has largely eliminated the hazard of motor burnouts.

Where direct current motors or slip ring induction motors are installed, it is desirable in most cases to provide solid covers over the top half bracket openings on the collector or commutator end of the motor. These can best be obtained by ordering with the motor. Such covers not only prevent the workman from coming into contact with live parts, but also prevent foreign matter from falling into the collector or commutator.

Where dirt conditions are sufficiently bad, totally enclosed "fan-cooled" motors can be provided. Motors of this type are totally enclosed, but are provided with fans both inside and outside the enclosure, so that the motor size is closely the same as the standard open motor.

Where hoists are used in connection with quarry operations, control safety devices are available which make it practically impossible for a runway to occur due to carelessness or ignorance on the part of the operator.

In conclusion I would like to refer to the totally enclosed type of gear reduction unit, which has been largely used in California cement mills within the past few years. Although not electrical equipment, the gear reduction unit is so closely allied to the driving motor as to warrant mention here. This type of gear reduction unit is a particularly happy combination in that it eliminates the personal hazard incident to open gearing and at the same time has higher efficiency and much longer life than the open type.

Cement Association "Trophy Club" Still Going Strong

THE list of cement mills which have had no lost-time accidents since January 1 is longer than any of its predecessors and hence is attracting unusual interest. These mills are popularly referred to as the "Trophy Club" because they are in line to win the Portland Cement Association trophy for a calendar year of safe operation. On November 5 the record of successful mills was as follows:

Alpha Portland Cement Co., Bellevue (Mich.) mill. George A. Lawniczak, Supt. Last accident April 16, 1927.
Alpha Portland Cement Co., Ironton (Ohio) mill. Frank C. Brownstead, Supt. Last accident December 8, 1926.
Alpha Portland Cement Co., Manheim (W. Va.) mill. W. L. Matthes, Supt. Last accident August 20, 1927.
Basic Products Co., Kenova (W. Va.) mill. E. J. Meyer, Supt.
Canada Cement Co., Ltd., Exshaw (Alba) mill. W. D. Armstrong, Supt. Last accident November 21, 1927.
Consolidated Cement Corp., Mildred (Kan.) mill. C. E. Caron, Supt. Last accident March 19, 1927.
Cowell Portland Cement Co., Cowell (Calif.) mill. E. D. Burnett, Supt. Last accident May 11, 1926.
Lehigh Portland Cement Co., Bath (Penn.) mill. H. H. Heller, Supt. Last accident December 2, 1927.
Lehigh Portland Cement Co., Birmingham (Ala.) mill. R. H. MacFetridge, Supt. Last accident November 25, 1927.
Lehigh Portland Cement Co., Foglesville (Penn.) mill. Last accident December 13, 1927.
Lehigh Portland Cement Co., Iola (Kan.) mill. C. A. Swiggett, Supt. Last accident September 9, 1926.
Lehigh Portland Cement Co., New Castle (Penn.) mill No. 3. W. H. Kleckner, Supt. Last accident July 22, 1926.
Lehigh Portland Cement Co., Sandt's Eddy (Penn.) mill. E. J. Gish, Supt. Last accident December 21, 1927.
Marquette Cement Mfg. Co., Cape Girardeau (Mo.) mill. Robert C. Matthews, Supt. Last accident December 23, 1927.
Pennsylvania-Dixie Cement Corp., Kingsport (Tenn.) mill. Felix Guenther, Jr., General Supt. Last accident May 23, 1927.
Pennsylvania-Dixie Cement Corp., Portland Point (N. Y.) mill. F. P. Werner, Supt. Last accident November 18, 1927.
Standard Portland Cement Co., Painesville (Ohio) mill. Erie J. Ochs, Supt. Last accident October 18, 1927.
Three Forks Portland Cement Co., Trident (Mont.) mill. Clarke F. Leh, Supt. Last accident August 26, 1927.
Trinity Portland Cement Co., Dallas (Tex.) mill. O. V. Bartholomew, General Supt. Last accident November 26, 1927.
Virginia Portland Cement Corp., Norfolk (Va.) mill. George F. Martinez, Supt. Last accident December 31, 1927.
Wolverine Portland Cement Co., Quincy (Mich.) mill. John Dieterman, Asst. Supt. Last accident December 20, 1927.

Of the above list of 21 plants, one, the mill of the Three Forks Portland Cement Co. at Trident, Mont., would be ineligible to win the association trophy, even though operated without accident until the end of the year, as it will have been in operation less than six months in 1928. Nevertheless, the improvement made by this mill has been marked and the record is perfect for the periods during which the mill operated.

November 5, 1927, fifteen mills still had perfect safety records from January 1 of that year, and ten of this number completed the calendar year without mishap.

Crushed-Stone Producers and Machinery Manufacturers Meet at New York

WHAT seemed to be, at first impressions, a national convention of the crushed-stone industry took place at the Pennsylvania hotel in New York City, October 26. The occasion was a regular monthly meeting of the New York State Crushed Stone Association and the annual pre-convention meeting of the Manufacturers' Division of the National Crushed Stone Association, and of the executive committee of the National Association.

At the New York State Crushed Stone Association there was a fine turn-out and a very interesting and instructive discussion of proposed changes in the state lien laws. The chief subject discussed was whether or not the crushed-stone producers should aid the state contractors' association to agitate certain changes in the statutes which would tend to eliminate the irresponsible bidder. The most interesting phase of the whole meeting was the fact that producers and contractors—business men generally—are beginning to take an active part in the drafting and passing of laws designed to govern business. George E. Schaefer, president of the New York State Crushed Stone Association presided, and nearly every one present took part in the discussion.

At the noon luncheon the principal speakers were George B. Holder, mining engineer, Air Reduction Co., New York City, and Gilbert H. Montagne, attorney, New York City.

Mr. Holder told of the experience of the Michigan Limestone and Chemical Co., Calcite, Mich., the largest quarry operators in the world (60,000 tons daily) with the new liquid oxygen explosive (L. O. X.). In substance his remarks were to the effect that the L. O. X. plant at the Michigan Limestone and Chemical Co. operation is producing approximately 2000 lb. of L. O. X. per day, at a cost of 7 cents per lb., and they are getting 12 tons of rock broken per pound of L. O. X. This plant is now supplying 25% of the explosive used on this operation; the balance of explosixe used is 40% gelatin dynamite, costing approximately 13 cents per lb. and giving a breakage of 6 tons of rock per pound of explosive.

At the Enos Coal Mining Co.'s strip-mine property (which is really a quarrying proposition on a large scale as they are handling some 750,000 cu. yd. of overburden per month) they are using 10,000 lb. of L. O. X. per day, which replaces 15,000 lb. of 40% gelatin dynamite or 30,000 lb. of black powder. The cost of L. O. X. at this operation ranges from 4½ cents to 5 cents per pound, it was stated.

Since the middle of July, when the Michigan Limestone Co. plant was put into operation, there has been an increasing interest shown in L. O. X. by the larger quarries throughout the country.

Mr. Holderer also discussed the history of L. O. X. both in this country and abroad and briefly described its manufacture, with which ROCK PRODUCTS readers are doubtless familiar, as there have been several previous articles on the subject.

Government of Business By Trade Associations

Mr. Montagne is a corporation attorney who has made a specialty of trade association and large corporation practice in which alleged violations of the Sherman anti-trust law have been the chief factor. His remarks briefly condensed, by himself, for publication are as follows:

"Never has the U. S. Government gone so far as during the past year in its encouragement, support and enforcement of business self-government by business and trade groups.

"One industry after another, in trade conferences called by the Federal Trade Commission, is today adopting rules for eliminating trade abuses, which rules are all registered with the Commission, and are daily being enforced with all the strength of the Commission's authority behind them.

"What this means, in upbuilding the tone and morale of American business, can hardly be over-estimated.

"Business ethics are created, not by laws, but by the opinion of business men.

"All the laws in Christendom are powerless to raise the business standards of a single industry above the level reached by the preponderance of public opinion among the reasonable and fair-minded men in that industry.

"This truth most people entirely overlook, when they are pushing new legislation to improve business standards.

"Business self-government, simply because it is self-government and not government imposed from an outside authority, is creating for business higher standards and more rigorous enforcement than have ever been attained either by the governmental authorities or the courts.

"Forward-looking leaders in the business world now recognize in trade associations a long awaited opportunity for business men, through methods of trade self-government of their own selection, to correct a large number of vexatious and long standing trade abuses.

"More and stronger trade associations, organized under proper conditions and with adequate safeguards, are foreshadowed by all these recent developments.

"Whatever will facilitate a closer adaptation of production and distribution to the requirements of demand will serve to bring under human control one of the most baleful causes of human unhappiness.

"Overproduction, business depression and unemployment, it is now realized, are comparable only to disease in the devastating and far-reaching injuries they inflict upon the morale and well being of the entire nation.

"Trade associations, if they will utilize these opportunities for business self-government, can raise American business to a level of achievement exceeding anything that has yet been dreamed of."

Other speakers at the luncheon were Otho M. Graves, president of the National Crushed Stone Association and A. T. Goldbeck, chief of the Association's Bureau of Engineering, both of whom spoke of the progress being made by the association, particularly of the new research laboratory.

Manufacturers' Dinner

At the evening dinner of the Manufacturers' Division of the National Crushed Stone Association, C. B. Andrews, chairman of the division presided. The committee on arrangements, as usual was Gordon Buchanan. Besides the executive committee of the National Association most of the members of the New York State Association also attended. The plans for the exhibit of the Manufacturers' Division at the coming convention at Cleveland, Ohio (January 21-24) were explained by Secretary J. R. Boyd and Chairman Andrews. The charge for booth space, it was announced would be $50.

President Graves, the members of the executive committee, and many others made short addresses.

Registration

The following crushed-stone producers were present:

H. B. Allen, General Crushed Stone Co., Philaaelphia, Penn.

B. R. Babcock, the Callanan Road Improvement Co., South Bethlehem, N. Y.

H. E. Bair, regional vice-president, member of the executive committee, the France Stone Co., Toledo, Ohio.

M. M. Bamberger, Interstate Construction Co., Springfield, N. J.

L. C. Bonnell, North Jersey Quarry Co., 9 Clinton St., Newark N. J.

J. R. Boyd, secretary, National Crushed Stone Association, Washington, D. C.

C. L. Buchholtz, Genesee Stone Products Co., Batavia, N. Y.

A. B. Caldwell, Genesee Stone Products Co., Batavia, N. Y.
C. M. Doolittle, regional vice-president and member of the executive committee, Canada Crushed Stone Co., Hamilton, Ont.
Harney N. Clark, 108 Burlington Ave., Rochester, N. J.
W. E. Foote, Wichwire-Spencer Steel Co., Gasport, N. Y.
A. T. Goldbeck, chief, Bureau of Engineering, National Crushed Stone Association, Washington, D. C.
O. M. Graves, president, National Crushed Stone Association, vice-president General Crushed Stone Co., Easton, Penn.
E. B. Havens, Interlaken, N. J.
E. Lee Heidenreich, Jr., New York Trap Rock Corp., Newburgh, N. Y.
J. C. Houston, Paterson, N. J.
A. S. Lane, Meriden, Conn.
John Odenbach, Dolomite Products Co., Rochester, N. Y.
A. S. Owens, Peerless Quarries, Inc., Utica, N. Y.
F. C. Owens, Rock-Cut Stone Co., Auburn, N. Y.
C. L. Petzel, New York Trap Rock Corp., Newburgh, N. Y.
John Rice, General Crushed Stone Co., Easton, Penn.
James Savoge, treasurer, National Crushed Stone Association, Buffalo Crushed Stone Co., Buffalo, N. Y.
Geo. E. Schaefer, General Crushed Stone Co., Rochester, N. Y.
F. W. Schmidt, North Jersey Quarry Co., Morristown, N. J.
James G. Shaw, Standard Trap Rock Co., New York, N. Y.
W. L. Sporborg, member of the executive committee, Rock-Cut Stone Co., Syracuse, N. Y.
A. L. Worthen, member of the executive committee, the Connecticut Quarries Co., New Haven, Conn.
I. W. Wortman, North Jersey Quarry Co., Morristown, N. J.

Equipment and machinery manufacturer representatives and members of the Manufacturers Division of the Association, registered, were:

C. B. Andrews, Taylor-Wharton Iron and Steel Co., High Bridge, N. J.
J. L. Averill, Davis and Averill, Newark, N. J.
W. M. Black, 30 Church St., New York, N. Y.
Gordon Buchanan, C. G. Buchanan Co., New York, N. Y.
D. A. Cheytte, Traylor Engineering and Manufacturing Co., New York, N. Y.
S. Edgar Cole, *Pit and Quarry*, New York, N. Y.
R. W. Conant, Bucyrus-Erie Co., New York, N. Y.
J. A. Cox, 50 Church St., New York, N. Y.
B. G. Dann, Hendrick Manufacturing Co., New York, N. Y.
H. M. Davison, Harnischfeger Sales Co., New York, N. Y.
George M. Earnshaw, ROCK PRODUCTS, New York, N. Y.
E. T. Finnert, Vulcan Iron Works, New York, N. Y.
F. E. Fisher, Allis-Chalmers Manufacturing Co., New York, N. Y.
G. W. Flounders, C. G. Buchanan Co., New York, N. Y.
G. D. Fraunfelder, Easton Car and Construction Co., Easton, Penn.
M. B. Garber, the Thew Shovel Co., Lorain, Ohio.
Fred A. Gill, Gill Rock Drill Co., Lebanon, Penn.
N. S. Greensfelder, Hercules Powder Co., Wilmington, Del.
Tom Henson, Marion Steam Shovel Co., New York, N. Y.
Edw. C. Hogan, American Brake Shoe and Foundry Corp., New York City.
A. A. Holland, Ingersoll-Rand Co., New York, N. Y.
S. C. Hodge, Niagara Screens, New York, N. Y.
J. F. Huvane, Chicago Pneumatic Tool Co., New York, N. Y.
W. E. Keine, Allis-Chalmers Manufacturing Co., New York, N. Y.
G. H. Keppel, C. G. Buchanan Co., New York, N. Y.
J. R. Lafferty, Hercules Powder Co., New York, N. Y.
J. A. Lang, E. I. du Pont de Nemours and Co., New York, N. Y.
John W. McCabe, Marion Steam Shovel Co., Philadelphia, Penn.
Wellington C. MacEwen, Allis-Chalmers Manufacturing Co., New York City.
L. E. MacFadyen, Philadelphia, Penn.
S. F. Macpeack, Earle C. Bacon, Inc., New York, N. Y.
W. H. Milroy, Earle C. Bacon, Inc., New Haven, Conn.
H. R. Nowland, Trojan Powder Co., Allentown, Penn.
R. N. Nicol, Rutherford, N. J.
W. S. Nicol, Cross Engineering Co., Carbondale, Penn.
W. F. Nothacker, Sanderson-Cyclone Drill Co., New York, N. Y.
G. A. Parker, Chicago Pneumatic Tool Co., New York, N. Y.
D. B. Patterson, Harnischfeger Sales Co., Philadelphia, Penn.
Fred S. Peters, ROCK PRODUCTS, New York, N. Y.
W. Vincent Pietsch, Earle Bacon, Inc., New York, N. Y.
J. Reynard, Loomis Machine Co., Tiffin, Ohio.
Nathan C. Rockwood, ROCK PRODUCTS, Chicago, Ill.
S. R. Russell, E. I. du Pont de Nemours and Co., Wilmington, Del.
B. G. Shotton, Hendrick Manufacturing Co., Pittsburgh, Penn.
E. V. Sihler, National Malleable and Steel Castings Co., New York, N. Y.
Clarence E. Silva, Marion Steam Shovel Co., W. Hartford, Conn.
R. C. Smith, Keystone Lubricating Co., New York, N. Y.
R. P. Sullivan, Marion Steam Shovel Co., New York, N. Y.
N. S. Tobey, Marion Steam Shovel Co., New York, N. Y.
W. L. Vannerson, Hercules Powder Co., New York, N. Y.
N. O. Weil, W. S. Tyler Co., New York, N. Y.
J. M. Wells, Ingersoll-Rand Co., New York, N. Y.
Thos. T. Woodhouse, Woodhouse Chain Works, Trenton, N. J.
William T. Woodhouse, Woodhouse Chain Works, Trenton, N. J.

Indiana Limestone Producers Set Up Voluntary Standards

NEW CLASSIFICATIONS and grading of construction and statuary limestone, without materially affecting prices, are being applied to specifications for future building everywhere in the United States, according to Allen E. Beals in the current *Dow Service Daily Building Reports.*

The Indiana Limestone Institute of Bedford, Ind., Lawrence H. Whiting, chairman, has gone a step farther than merely grading and establishing a uniform classification of Indiana limestone.

It has set up a tribunal before which all disputes arising between specifiers, distributor, erector or ultimate consumer, as to classification or grading of stone of any quarry or the grading of any trade-named variety or specialty, shall be adjudicated.

This trade-court of last resort is the Indiana Limestone Institute, which is made up of leading limestone producers of the country, or such committee as may be appointed by the institute to pass judgment on such matters for final decision.

While the report of the special committee on grading and uniform classification fixed the close of business September 30, 1928, as the deadline upon which the old standards were to make way for less wasteful and more workable grading and classification of building and statuary limestone, the new standards are just beginning to confront stone cutting and erecting contractors as they are invited to submit their estimates and make their formal bids for business offered.

In connection with minute descriptions of just what the specifying architect, owner, builder, erector or stone cutter may expect to receive or submit, as the case may be, the new standard contains a notation stating that the new classification and designation of grades is based on the assumption that in submitting of samples of any particular grade for approval, the well established practice of using two samples, showing the maximum and minimum or fineness and coarseness of texture, (thus showing the range of variation from uniformity) will be followed, instead of submitting only one sample intended to indicate the average run of the particular grade.

Standard practice in the new code relating to samples says:

"The submitting of two samples has, therefore, been adopted as 'Standard Practice'; except in the case of 'Statuary Buff' where a single sample will usually suffice, and in the case of 'Old Gothic,' the characteristic range of which cannot be appropriately shown by only two samples."

Dealing with special grades or so-called specialties (trade-named and trade-marked varieties, or individual gradings of the product or certain quarries) the new code says:

"All specialties or gradings of stone given fancy names or trade-mark designations now in existence or hereafter placed on the market, shall be submitted to the Institute or to such committee as may be appointed for appropriate specifications and grading rules and shall be graded in accordance with the equivalent regular trade as to texture and color-tone, and under this system of grading and inspection be so classified.

"Where there is any particular variety of stone that is distinctive in some feature, and thus worthy of a special name, it shall in no case be classified for purpose of grading lower than Rustic Buff."

The committee that formulated this report consisted of W. H. Johnson, president of the Bloomington Limestone Co.; B. P. Crowe, president of the Indiana Oolitic Limestone Co.; J. L. Torphy, president, Shawnee Stone Co.; Nelson Joyner, vice-president, Indiana Limestone Co., and H. S. Brightly, secretary of the Indiana Limestone Institute.

North Carolina Quarry's Life Extended by Court

OPERATION of a stone quarry near Wilmore, N. C., by the Carolina Crushed Stone Co., scheduled to have been stopped on October 20 by court order, will continue until December 20, 1929, according to an order of the court signed by Judge W. F. Harding recently.

A restraining order to stop blasting at the quarry on October 20, 1928, was signed several months ago, but by agreement on both sides the time limit was extended until the new date, it was stated in court recently.

The original injunction and the order signed recently were results of four suits filed in Mecklenburg superior court several months ago against the crushed stone company seeking damages. The plaintiffs in the suits were Holton Realty Co., T. J. Norris, M. L. Toomey and W. H. Holton.

Wall Street View of United States Gypsum

IN VIEW of the highly satisfactory conditions obtaining in the industry officials of the United States Gypsum Co. express considerable satisfaction over the manner in which the company has demonstrated its ability to earn a good return for its stockholders. The company has amply demonstrated its claim to leadership of the industry by the ease with which it has withstood the effects of two years of very severe price cutting by its competitors and by the fact that it was not until comparatively recently that it met fire with fire and commenced price cutting on its own account. While as a result of these competitive measures its earning power has been impaired it has not been seriously damaged.

In all probability 1928 will be the poorest year for the company in the last five years from the viewpoint of earnings, but it is equally probable that final results will disclose that the common dividend on the present annual cash disbursement basis has been earned something over three times. Based on the knowledge that officers of the company can see little improvement in store for the industry in the near future it is difficult to estimate earnings for the last half of the present year at much better than $3,000,000, which would make it the poorest six months' period experienced since the price war commenced almost two years ago. On the basis of such a showing for the final half it could not be hoped results for the full year would equal the record levels of 1926 and 1925. It appears probable at this time that net for 1928 will fall at least $1,000,000 short of 1927 results and about $750,000 under the showing of 1924.

The capitalization changes effected during the present year, it is reasoned, constitute a bullish argument for stockholders as indicating that in spite of the United States Gypsum Co. express consider of the future outlook. The company has pursued a policy of paying relatively small cash dividends on a regular basis, the present rate being $1.60 a share annually, and from time to time making extra cash disbursements as well as substantial payments in stock. For the current year stockholders have received in addition to the regular payments an extra cash dividend of 40c. a share, a stock dividend of 10% which was payable July 10 and an offering of rights to subscribe to 380,222 additional shares of common at $20 a share, in the ratio of one new share for each two held.

In estimating per share earnings the total of stock to be outstanding as a result of these changes has been used, although in reality the stock issued as a dividend will have been outstanding for less than half a year, while the stock offered for subscription will not be fully taken up until next October, the offering having been made on the basis of quarterly payments, the stock to be issued upon payment of the fourth installment, due October 1, 1929.

Income Estimated

Based on the steady decrease in net earnings for the last three six-month periods estimates of the results to be shown for the six months to end December 31 next range from $3,000,000 to $3,100,000. After making allowance for 7% dividends on 78,417 preferred shares (of $100 par value) such earnings would be equal to $2.40 or $2.47 per share, depending on the number of shares used as a basis for the computation. For the six months ended June 30, 1928, the company reported net income of $3,334,487, indicating that full year's results should range between $6,300,000 and $6,400,000, equal to about $5.09 or $5.16 per share on the enlarged number of common shares to be outstanding on December 31. For the year 1927 the company reported net income of $7,538,508, equal after preferred dividends to $10 a share on only 691,198 common shares then outstanding.

As a result of the sale of additional shares the company's treasury will receive about $7,604,440, which combined with surplus earnings—the result of the conservative cash dividend policy of the company—will enable it to pursue its expansion program. In spite of the bad conditions already referred to the company is actually doing a tremendous volume of business, which makes necessary enlargement of its physical properties. The company now has under construction, or about to be started, new plants at Boston, Philadelphia, Detroit, and Chicago. The strategic location of these plants, having both rail and water transportation facilities, is expected to affect their manufacturing costs materially, and when in operation should enable United States Gypsum to meet competitive costs even more effectively than it now does.

Price Cutting

The fact that the price cutting now universally employed in the trade has been the result of competitive tactics rather than the passing on to the public of savings through the increased volume of business is well demonstrated by a survey of U. S. Gypsum's earnings for the past two years. For the final six months of 1925 the company has indicated net earnings of $4,322,849, which fell off to $4,130,829 for the first half of 1926, but rose again to $4,244,918 for the second half of the year. Sincethat time the trend has been steadily downward, averaging a diminution of more than $300,000 each six months for the last eighteen. Results for the first half of 1927 were $352,617 under those for the final half of 1926. This drop was followed in turn by one of $246,094 for the next six months' period, while earnings for the first six months this year showed a still further decrease of $311,720. Since from the admission of officers of the company there is little prospect of change, still further cuts in price having gone into effect subsequent to July 1, there is every reason to believe that the current six months' period will disclose another comparable drop, to place income for period in the neighborhood of $3,000,000 as compared with $4,244,918 for the second half of 1926.

A consideration in the competitive situation is the extent to which competing companies can carry their welfare. In view of the apparent effect on so well established an earner as United States Gypsum it is not unreasonable to suppose that companies less fortified as to assets, earning power and sales organization must already have suffered severely. That this is the case can not be doubted, as rumors of alliances, mergers and consolidations have been the talk of the trade for some time. However, Sewell L. Avery, president of the Gypsum Co., points out that mergers under the stress of competitive warfare furnish a very severe psychological problem in that the matter of rapprochement of conflicting personalities becomes a highly essential consideration.

Because of the uncertainties presented by such a situation Mr. Avery declined to commit himself on the outlook for the company. He declared that although experiencing materially lower profit margins, the company was doing a large business and was earning its requirements with a handsome margin while going ahead on a considerable program of plant and sales expansion. He expressed a firm belief that stockholders willing to wait through the present period of uncertainty would receive an ample reward. In that connection it is pointed out that even under the enlarged capitalization and before the benefits from the alteration can accrue and in spite of an unsettled industry the company will show earnings of better than $5.10 a common share as against a dividend rate of $1.60 and a ratio of earnings to market price of the stock about 1 to 12.—*Wall Street News* (New York City).

Virginia Feldspar Plant Nearing Completion

THE PLANT of the Clinchfield Sand and Feldspar Corp., Brookneal, Va., will soon be completed if present progress in construction continues. A large quantity of new machinery has arrived and has been stored in the building. The concrete foundations for the heavy machines are being poured and the machinery will be placed as rapidly as possible.—*Brookneal* (Va.) *Union Star.*

Census of Lime Manufacturers

THE DEPARTMENT OF COMMERCE announces that according to data collected at the biennial census of manufactures taken in 1928, the establishments engaged primarily in the production of lime in 1927 reported a total output valued at $41,587,458, a decrease of 18% as compared with $50,736,499 reported for 1925, the last preceding census year. The quantities and values of the principal products, for 1927 and 1925, are as follows: Quicklime, 1927, 2,287,177 tons, valued at $20,919,127; 1925, 2,608,582 tons, valued at $26,310,529; decrease in quantity, 12.3%; decrease in value, 20.5%. Hydrated lime, 1927, 1,461,654 tons, valued at $14,055,374; 1925, 1,453,600 tons, valued at $15,539,371; increase in quantity, six-tenths of 1%; decrease in value, 9.5%.

This industry designation is applied to establishments engaged in the production of lime, chiefly from limestone but to a small extent from shells and other substances. The quarrying and the burning of limestone are usually carried on by the same establishments, and for such establishments the statistics given cover both branches of the work. (Establishments engaged exclusively in the quarrying of limestone, which is not a manufacturing operation, are not classified in this industry.)

Of the 260 establishments reporting for 1927, 36 were located in Pennsylvania, 22 in Ohio, 22 in Virginia, 19 in Wisconsin, 12 in Missouri, 12 in New York, 10 in Alabama, 10 in California, 9 in Massachusetts, 9 in Tennessee, 8 each in Illinois, Michigan, Vermont, and West Virginia, 7 in Maryland, 6 in Connecticut, 6 in Indiana, 5 in Maine, 5 in Utah, 5 in Washington, 4 in Texas, 3 in Arkansas, 3 in Colorado, 3 in Minnesota, 2 each in Florida, Iowa, Montana, New Jersey, and North Carolina, and 1 each in Arizona, Georgia, Idaho, Kentucky, Nevada, New Mexico, Oklahoma, Rhode Island, South Carolina, and South Dakota. In 1925 the industry was represented by 283 establishments, the decrease to 260 being the net result of a loss of 47 establishments and a gain of 24. Of the 47 establishments lost to the industry, 13 went out of business prior to 1927, 18 reported commodities other than lime as their principal products and were therefore transferred to the appropriate industries, 10 were idle throughout the year, and 6 reported products less than $5,000 in value. (No data are tabulated at the biennial censuses for establishments with products under $5,000 in value.)

Summary statistics for the industry are given in Table 1, and special statistics on products in Table 2. The figures for 1927 are preliminary and subject to such correction as may be found necessary after further examination of the returns.

TABLE 1.—SUMMARY FOR THE LIME INDUSTRY: 1927 AND 1925

	1927	1925	Per cent decrease (—)
Number of establishments	260	283	— 8.1
Wage earners (average number) (1)	10,820	12,095	—10.5
Wages (2)	$12,190,918	$14,002,128	—12.9
Cost of materials, supplies, fuel and purchased power, total (2)	$17,269,467	$20,049,363	—14.3
Materials and supplies	$ 9,690,298	(3)	.....
Fuel and power	$ 7,579,169	(3)	.....
Value of products (2)	$41,587,458	$50,736,499	—18.0
Value added by manufacture (4)	$24,317,991	$30,687,136	—20.8
Horsepower	83,361	87,871	— 5.1

(1) Not including salaried employees.
(2) The amount of manufacturers' profits cannot be calculated from the census figures, for the reason that no data are collected in regard to a number of items of expense, such as interest on investment, rent, depreciation, taxes, insurance, and advertising.
(3) Not reported separately.
(4) Value of products less cost of materials, supplies, fuel, and purchased power.

Data on New Texas Cement Plant at San Antonio

CONSTRUCTION of a three-mile spur track by the Missouri Pacific railroad from its main line to the new plant which the Republic Portland Cement Co. is constructing near San Antonio has been completed. The company has 312 men employed in the construction of the plant which will cost $2,750,000.

Foundation for the kiln is already in. The foundation goes down 20 ft. into the ground and rises 15 ft. above it. It will carry a kiln 11 ft. in diameter and 250 ft. long.

Foundations for two coolers are also in. The coolers will each be 10 ft. in diameter and 100 ft. long.

Workmen are now pouring foundations for four compeb grinding mills.

Work has been started on a building 200 ft. long and 80 ft. wide to house the machine shop, storeroom and employes' washroom. This building will be of stone, tile and stucco construction.

The company has also started work on a storage building for raw and finished cement. This building, 350 ft. long and 80 ft. wide, will be served by an electric traveling crane of 7½ tons capacity. The crane will have a lift of 80 ft.

Work on eight slurry tanks is under way, and also on 14 cement storage silos. The slurry tanks will each be 24 ft. in diameter and 30 ft. high. The silos will be 30 ft. in diameter and 70 ft. high and hold 150,000 bbl. of finished cement.

All electrical equipment was purchased from the General Electric Co. Four 800-hp. motors, two 300-hp. motors and more than 75 smaller motors were purchased.

The San Antonio Public Service Co. has started construction of a sub-station with four large transformers for carrying power to the plant. This sub-station is two miles from the high line and will cost $65,000.

Work will be started within 20 days by the Southern Gas Co. on a three-mile pipe line. The plant will use 140,000,000 cu. ft. of gas monthly, more than the total amount used by San Antonio with the exception of one industry.

Workmen at present are living in 25 temporary frame cottages and as many tents with a large mess hall built for serving three meals daily to 100 men. The frame houses will be replaced by modern cottages when the plant starts running. The company plans to have a community center for 125 families.

Thirty-five thousand dollars will be spent in collecting dust in the plant, which will be as clean as a modern office building.

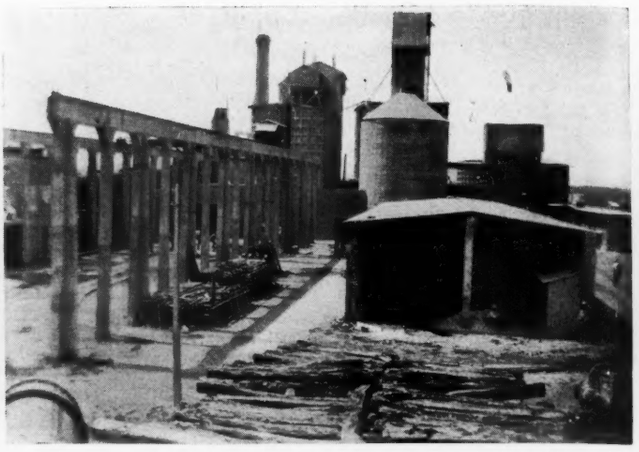
The company is composed entirely of Texans, with J. H. Smith as president and W. M. Thornton, vice-president. A. F. Sayers is in charge of construction work, all work being done by Smith Brothers, Inc. The company will have permanent offices on the eleventh floor of the Smith-Young Tower.

TABLE 2.—PRODUCTS, BY KIND, QUANTITY, AND VALUE: 1927 ANR 1925

	1927	1925	Per cent of increase (+) or decrease (—)
Total value	$41,587,458	$50,736,499	—18.0
Quicklime:			
Tons	2,287,177	2,608,582	—12.3
Value	$20,919,127	$26,310,529	—20.5
Hydrated lime:			
Tons	1,461,654	1,453,600	+ 0.6
Value	$14,055,374	$15,539,371	— 9.5
Agricultural lime:			
Tons	257,395	(1)	.....
Value	$ 1,247,820	(1)	.....
Limestone sold as such:			
Tons	2,760,958	4,081,828	—32.4
Value	$ 3,105,521	$4,809,404	—35.4
Other products, value (2)	$ 2,259,616	$4,077,195	—44.6

(1) Not reported separately.
(2) Road material, lime marl, lime putty, poultry grit, plaster, screenings, etc.

General view of the "Landa" cement plant at Puebla, Mex., where a number of improvements are under way

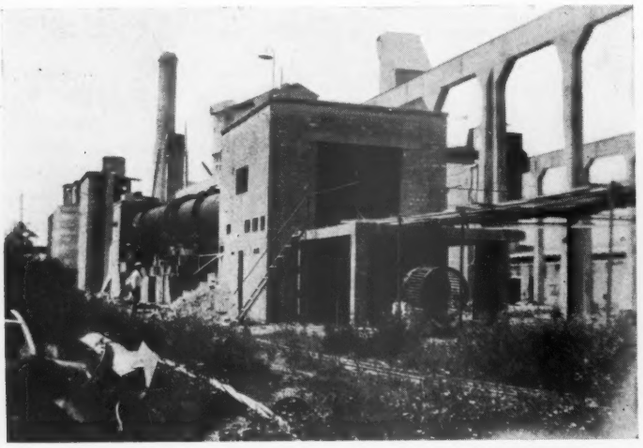


The "Landa" plant showing the new craneway at the left and alterations being carried on in the building at the right

"Landa" Portland of Mexico to Make Improvements

A RECENT letter from Alton J. Blank to ROCK PRODUCTS summarizes the work which is being carried out at the plant of the Compania de Cemento Portland "Landa," S. A., at Puebla, Mexico. Mr. Blank is now the general superintendent and supervising chemist at this Mexican mill. The plant has been operating for six or seven years, and at the present time the company is rearranging its existing equipment to a large extent and adding other units. The most interesting feature of the work is that the plant is kept in steady operation during the alterations despite the big handicaps to be met.

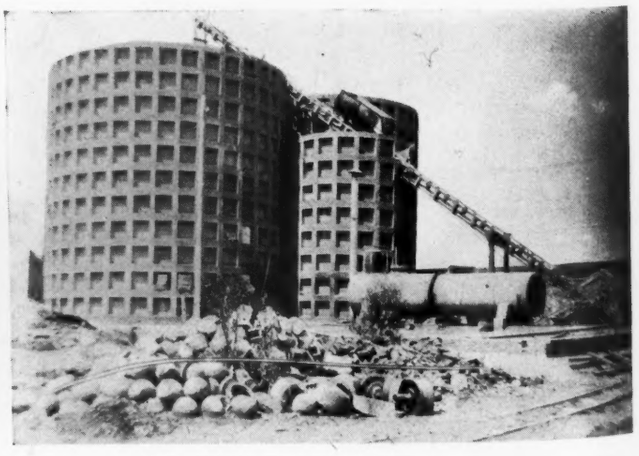
The improvements include a 6x70-ft. kiln with dryer attached and a much larger kiln, 6x131 ft. 6 in. These units will be complete with dryers, coolers and other necessary equipment. There will be a large craneway and additional clinker and gypsum storage facilities. The clay and limestone storage silos are to be equipped with Schaffer poidometers. The facilities will also include lime kilns and a hydrating plant for lime.



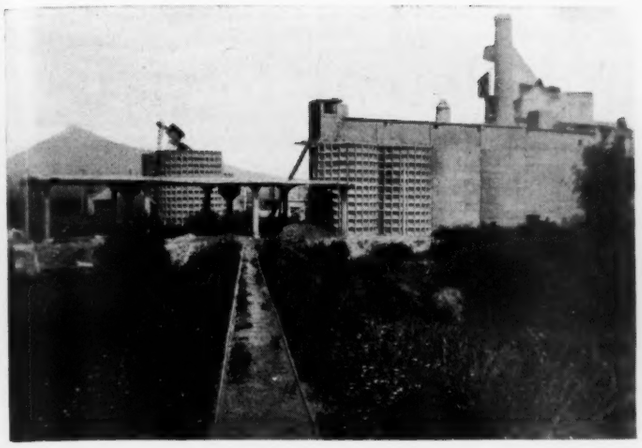
New unit with the 6 ft. x 131 ft. 6 in. kiln

The smaller kiln unit with its attached dryer

Note the picturesque surroundings of the "Landa" plant. The large kiln is seen to the right



The clinker and crushed gypsum storage silos showing the inclined railway method of filling



The unusual roof covering for the crushers at the "Landa" plant with the clay and limestone storage silos beyond

A general view of the "Landa" plant with the lime kilns and hydrating and packing plant in the foreground

Louisiana Cement Co. Official Protests Imports of Cement

"THE CLOSING OF ONE LARGE EASTERN CEMENT PLANT and a virtual shutdown in two others, due to increasing imports for duty-free European cements, are causing American portland cement manufacturers to renew their demands for assurances of early tariff relief," says Vice-President Scott Thompson, of the Louisiana Portland Cement Co. "In addition, two other large companies have been compelled to pass their usual dividends because of the serious inroads on their markets, and the president of a third company has announced that a shutdown of his plant is imminent.

"The affected plants are located at widely separated points near the Atlantic seaboard. Domestic manufacturers submit this as proof that their entire eastern and gulf market is dangerously depressed, and that European manufacturers can dispose of their product profitably with disastrous consequences to home industry.

Lay Off Workers

"The cement plants which have been forced to lay off workmen and to reduce production are the Thomaston, Me., plant of the Lawrence Portland Cement Co., which has made a 50% reduction in its operations and the Lone Star Cement Co., at Nazareth, Penn., which has cut its production 65%.

"The Tampa plant of the Florida Portland Cement Co. was closed temporarily and George F. Bayle, Sr., president of the Glen's Falls Portland Cement Co. at Glen's Falls, New York, declared last week that a substantial reduction in his payroll would be necessary unless some check is placed upon the flood of imports.

"In announcing the suspension of the last quarterly dividends of the Pennsylvania-Dixie Cement Corp., which has plants in five cities, Chairman John A. Miller declared that this step was inevitable because of the competition of foreign cement produced on a basis of pay for labor about one dollar a day and entering duty free. The North American Cement Corp., at Albany, N. Y., suspended dividend payments for the same reason.

"Discussing the shut-down of the Thomaston plant, Frank L. Smith, president of the Lawrence company, said:

" 'This is caused by foreign competition. Government figures for the first six months of 1928 show that 1,141,279 bbl. of cement have been imported. This is an increase of more than 50% over the first six months of 1927 when 758,921 bbl. were imported. We are pleased at the treatment we have received in New England but we cannot compete with cement manufactured on a wage scale of 19½ cents an hour and until the matter is adjusted by a tariff the cement industry in this country is going to be greatly handicapped.'

Laid to Imports

"D. S. MacBride, vice-president of the Lone Star Cement Co. of Pennsylvania, also attributed the 65% reduction in the production of his company to imports.

" 'This partial shut-down will of necessity remove quite a number of men from our payroll, a condition which the management sincerely regrets,' he continued. 'There is, however, no alternative under present conditions, which are largely due to the increasing importations of foreign cement which are coming into the northeast and central seaboard territories, particularly Philadelphia and Boston.'

"We shall continue our efforts to maintain our rightful markets, but the permanent solution of the problem rests with the granting of an adequate tariff.

"The Glen's Falls Portland Cement Co. will close before it will make a wage-reduction according to George F. Bayle, Sr., its president. Its directors believe that the day of low wages has passed and that the prosperity of the country depends on the maintenance of the present wage scale and standards of living.

"Our most dangerous competitor," says Mr. Bayle, "is Belgium. She has maintained her extremely low standards of living, low wages and low production costs while organizing her construction industries especially for export business to high standard countries, especially the United States. As a result, Belgian material costs are now 4% lower than in 1913. In the United States the same materials are 77% higher.

"With low wages in Belgium there is practically no buying power to consume the large production of cement. The result is that Belgian manufacturers have to go abroad to sell and they have made the United States their particular market."—*New Orleans* (La.) *Tribune.*

Many Improvements Contemplated at Alpha Cement's Ironton Plant

OPERATION of the Ironton, Ohio, plant of the Alpha Portland Cement Co. has been suspended as the first step in a reconstruction program planned by officials of the concern. The shaft of the plant mine is to be walled with concrete and other improvements are to be made.

The mine shaft is 560 ft. deep and this job alone is expected to occupy workmen for several months. The shaft is approximately 12 ft. square and it is to be walled with concrete from the surface opening to the mine level. All timber supports are to be eliminated, reducing repair and upkeep to a minimum. Two electrically operated elevators are to be installed to carry the limestone.

Improvements planned in the mill department call for installation of several electric cranes and other apparatus, it is understood.

The plant and mines closed down October 30 and work on the mine shaft has already started. Some of the mill workers have been kept on their jobs, but the bulk of those employed at the plant will be idle during the winter repair program.—*Ironton* (Ohio) *Tribune.*

Foreign Abstracts and Patent Review

French Ash-Fusing Gas Producer for Cement Making. An ash-fusing gas producer has operated intermittently at Meons at the St. Etienne mines in France since 1921, handling per 24 hours 13½ tons of washery refuse containing 8% of moisture and 60% of ash wash which is converted into cement and into gas for boiler firing. A second plant, at Treuil, is to handle 65 tons of refuse in 24 hours. The Meons plant has a fixed producer, a fan of 106,000 cu. ft. of air per hour, delivering at capacity 59 in. water pressure, and a Philipon type air-heating plant. The producer has a section of 5.38 sq. ft. at the tuyeres and is 16.4 ft. high; it is provided with six water-cooled tuyeres and two tapping holes, one for the iron and one for the slag produced. The air-heating apparatus consists of two groups of tubes in series, one set being made of fused quartz and the other of metal. The air is passed through at a velocity of 100 ft. per sec., and its flow broken up by the interposition of materials which are heated by radiation and give up their heat to the air passing by them. This new air-heating principle has doubled the capacity and the efficiency of the tubular heaters formerly in use. Poor or rich gas, purified, or heavy oil may be used as a fuel for the Philipon air heaters. It has a remarkable flexibility and an efficiency of about 80%, and can operate at temperatures to 1472 deg. F.; but since the fuel consists of stuff from the picking belt containing 60 to 65% of ash, of the fluxes containing 90% of calcium carbonate, and also of a certain quantity of coke breeze containing moisture and 30% of ash, the temperature of the air blast can be lowered to 1112 deg. F., permitting the use of metal tubes in the air heater. The quantities of heat absorbed by the fusion of the slag and the iron, and also by the reduction of the oxides is shown in the following table:

The producer produces gas of the following composition at the top: CO_2 5.2%; CO 28.0%; H_2 3.0%; CH_4 2.8%; N_2 61.0%; total, 100%, with a higher calorific value at N. T. P., 137 B.t.u. per cu. ft. At the base of the producer there are slag and cast iron as products, the slag having the following composition: SiO_2 36%; Al_2O_3 23.%; FeO 0.5%; CaO 38.5%; MgO 1.2%; total, 99.2%. The composition of the cast iron is as follows: O 2.90%; Mn 0.35%; Si 4.70%; S 0.05%; Ph 0.60%; Fe 91.40%; total 100.00%. The slag is used for the manufacture of cement, of which the composition is as follows: SiO_2 28.8%; Al_2O_3 15.3%; FeO 0.3%; CaO 50.0%; MgO 1.0%; loss on ignition 4.0%; total 99.4%. The ash-fusion gas producer at St. Etienne uses in a 24-hour day 11 tons of refuse (schists), 4 tons of coke breeze and 5 tons of flux or 20 tons total, which yields 1,236,000 cu. ft. of gas, 12 tons of slag and 0.75 tons of silicious cast iron, the average rate of gasification being 0.155 ton per sq. ft. per hr., which is very satisfactory. The gas is used for heating purposes, and the slag, after adding the necessary proportion of lime, is sold in the form of cement.—*The Engineer*, (1928), July 13, p. 34, from paper by M. Charles Berthelot.

PER CENT ASH IN COMBUSTIBLE

	20	30	40	50	60
Calorific value of combustible, B.t.u. per lb.	11,800	10,450	9,130	8,180	6,430
Weight of flux per lb. of combustible, lb.	0.16	0.24	0.32	0.40	0.48
Weight of slag produced, lb.	0.26	0.39	0.52	0.65	0.78
Weight of cast iron produced, lb.	0.023	0.034	0.046	0.058	0.069
Heat absorbed by the fusion of slag, B.t.u.	187	281	374	468	561
Heat absorbed by the decomposition of the flux, B.t.u.	129	194	259	340	389
Heat absorbed by the reduction of Fe_2O_3, B.t.u.	66	99	132	165	198
Heat absorbed by the reduction of SiO_2 and P_2O_3, B.t.u.	22.9	34	45.6	57.1	68.5
Heat absorbed by the fusion of the iron, B.t.u.	12.4	18.7	23.1	31.2	37.5
*Total heat absorbed per lb. of combustible handled, B.t.u.	420	627	837	1043	1252

*Failure of totals to check with addition is due to slide rule conversion from metric units.

Effect of Intensifiers and Reducers on the Rapidity of Hydrating or Unbinding of Stucco Gypsum. Peter Budnikoff summarizes the results of his observations on stucco gypsum as follows in the *Kolloid-Zeitscrift*, 44, 3, pp. 242-249, 1928: In mixing stucco gypsum with water, the temperature of the mixture increases rapidly due to the hydration which takes place. In connection with the swelling up of the grains of gypsum under the influence of water and the formation of a colloidal gel on their surfaces, the hydration process slows down, whereby the temperature is lowered gradually. The further hydration of the gypsum particles and the formation of crystalline needle-shaped forms from the colloidal gel effect a rapid crystallization of the dihydrate after the course of a certain induction period which may be prolonged or shortened according to the nature of the added increment; the temperature of the mass increases thereby again, and the volume of the gypsum increases. The solutions of salts, acids, alkalies, double and complex combinations change the nature of the thermic curves considerably—the termination of the hydration of the gypsum is accelerated or retarded. This phenomenon can be explained by the increase or decrease in the solubility of the gypsum and by the variation in the rapidity of the coagulation of the gypsum gel and in many cases by the formation of double combinations and exchange reactions between the sulphuric acid calcium and the introduced combinations.—*Tonindustries-Zeitung*, 52, 40, p. 818, 1928.

The Process of Lime Burning. At the General Meeting of the Society of German Chemists this year, Prof. Dr. S. H. Huettig, Prague, spoke on the above subject and reported that the burning of lime is not such a simple process as is almost universally assumed. He pointed to the behavior and the characteristic of the following types of reactions:

(a) Metallic CO_2 (crystallized) → Metallic O (crystallized) + CO_2 (gas);
(b) Metallic CO_3 (crystallized) → Metaltalic $O \cdot n\,CO_2$ (crystallized) $(1-n)$ CO_2 (gas), whereby $1-n$ represents a constant, entirely positive number;
(c) Metallic CO_3 (crystallized) → Metaltalic $O \cdot x - CO_2$ (crystallized + $(1-x-)$ CO_2, whereby x– means a genuine fraction with values varying continually between two certain limits.
(d) The reactions in which amorphous materials participate;
(e) The reactions which contain typical moments which retard the introduction of equilibrium.

Then he reported the essential results of the many test series carried out by M. Lewinter in regard to the static and dynamic appearances in the thermic disintegration of the calcium carbonate, and likewise also the x-ray spectroscopic photographing which T. Boehm has carried out on these preparations. Thereby, increased importance falls to the ability of the calcium carbonate to form solid homogeneous phases of variable composition with calcium oxide, also to the fact that sound, unaffected crystals of the calcium carbonate do not give off carbon dioxide with provable velocity, if the carbon dioxide pressure maintained above it is not a certain value lower than the accessory equilibrium pressure.—*Zeitschrift fuer angewandte Chemie*, No. 23 (1928), p. 612.

Lime in Cement-Trass Mixtures. In order to render the concrete for construction exposed to water less porous and more resistive, various experiments have been made with admixtures to decrease the size of the pores, for in the hardening of hydraulic binders certain intermediate and final products result, which are more or less soluble under special conditions in water or aqueous solutions, and which disintegrate the walls of the pores. The pore-closing effect of a sufficiently finely ground mineral filler or admixture, which in itself withstands the dissolving action of the water or aqueous solution without affecting by its volume relation the hardening of the mortar, is increased considerably if the filler is such that due to its

chemical composition it is able to set the materials dissolved from the mortar or the solutions accumulating in the pores, particularly lime, into an insoluble condition before they are carried from the mortar, so as to retain them in the pores, fill the pores gradually and stop the liquid from circulating in the mortar. Considerable lime is liberated in the hardening of portland cement; therefore those fillers should be used for portland cement mortar which set the lime and render it insolubly hard. Admixtures of this kind are, for example, finely ground blast furnace slag, silicate material, and trass, for they contain silicic acid which changes the excreted lime into lime-silicate. Although a mortar thus prepared sets slower at the start and the hardening period is much longer, the final strengths are considerably greater than in the ordinarily prepared portland cement mortar. Less known are mortar mixtures of cement, lime, trass and sand. A mixture of one part by weight of portland cement, 0.5 part of Bavarian trass (ground to cement fineness), 0.75 part of pressed lime putty and 5 parts of standard sand was tested with the following results:

Hardening period		Strength		
In air days	under water days	Tensile lb. sq. in.	Compressive lb. sq. in.	Tensile/ compressive
1	2	312.9	3470.5	0.091
1	6	465.5	4722.1	0.077
1	27	422.4	5959.6	0.071
1	89	554.7	7837.1	0.071
1	364	672.8	9046.0	0.074

The ratio of tensile strength to compressive strength never attains the value 0.10. The compressive strength is that of a good cement-sand mixture. It is striking that under a combined storage of 1 day in air and 6 days in water and then 21 days in air, the strengths were markedly less than those for under-water storage alone, being 384 lb. per sq. in. tensile and 5390.7 lb. per sq. in. compressive strength. The above cement-trass mixture, without the use of standard sand, is being used in the construction of a concrete dam.—*Tonindustrie Zeitung* (1928), **52**, 51, pp. 1037-8.

Contribution to the Knowledge of High Alumina Cements. In connection with the experiments of Berl and Loeblein, Feret believes that the quality of the hydraulic cements could be further increased, if they were produced with a possibly lowest content of silicic acid. A pre-requisite for the production of such cements would be the use of purer bauxites, which, however, are thus far being used for other manufacturing purposes.—*Le Ciment* No. 5 (1928), pp. 205-207.

Cement Works for Rhodesia. A company has been formed in Rhodesia for the manufacture of portland cement. Suitable deposits of limestone and shale have been acquired at Chipongwe, some 350 miles north of Wankie, and a factory capable of producing 40,000 bags of cement a month is to be erected there.—*The Engineer* (1928) Vol. 146, No. 3790, p. 229.

Concerning Cement Testing in Italy. According to his article in *Cemento Armato*, Prof. Eng. Guilio Revere has determined the strengths of scores of samples of cement and gives the results preparatory to new cement standards.—*Tonindustrie-Zeitung* (1928), **52**, 56, pp. 1138-1139.

Recent Process Patents

The following brief abstracts are of current process patents issued by the U. S. Patent Office, Washington, D. C. Complete copies may be obtained by sending 10c to the Superintendent of Documents, Government Printing Office, Washington, for each patent desired.

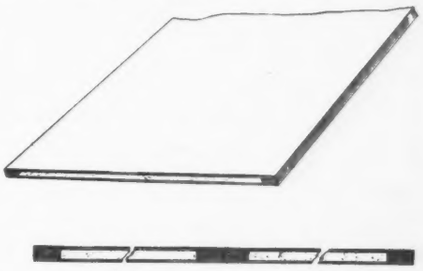
Gypsum Insulating Material. The patent relates to a method of producing a gypsum cellular material to be used as a non-conductor of heat or sound and also for a fire-resistant as well as for vermin-proofing.

The patentee advocates the use of 400 lb. gypsum, 10 lb. aluminum sulphate, 4 lb. 13 oz. sodium bicarbonate, 1 lb. 12 oz. hydrated lime, 1 lb. 5 oz. oxalic acid, and 6 oz. retarder.

The alum and bicarbonate react to form CO_2 gas which becomes entrained in the mass. To assist the trapping of the gas bubbles a colloidal substance such as glue or retarder is recommended. The oxalic acid is used as a soluble retarder to delay the setting time and the lime is added to give strength to the wall structures of the cellular mass.

It is claimed that repeated leveling-off of this mixture is not necessary, as the mass assumes the maximum size immediately, so that only one operation of that nature is necessary.—*Warren H. Emerson, assignor to Certain-teed Products Corp.*, October 9, 1928. U. S. Patent No. 1,687,285.

Plaster Board. The invention is an improved plaster board comprising a body of plastic cements having faces of fibrous material, and provides, at the opposite ends and at spaced intervals throughout the body of the sheet, inserts of fibrous material for the purpose of reinforcing the side edges and for providing a nailing strip.—*Alexander S. Speer, assignor to United States Gypsum Co.*, October 9, 1928. U. S. Patent No. 1,686,671.

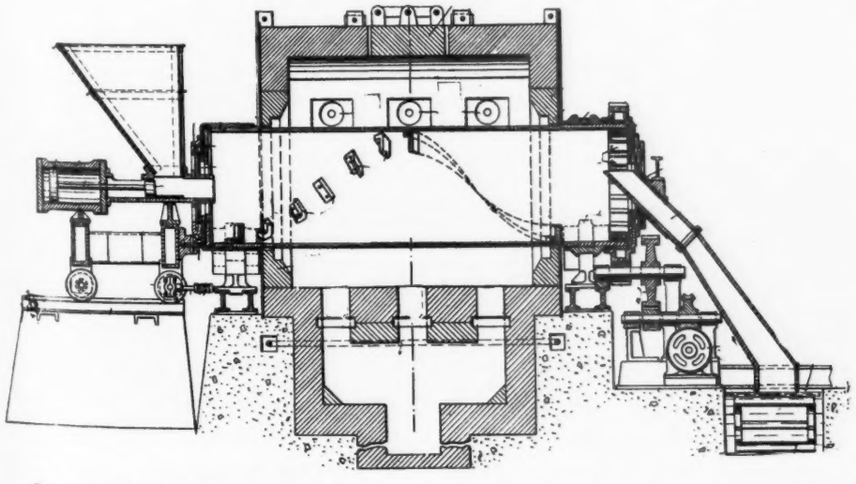


Special design of plaster board has reinforced edges

Lithopone Calcining Furnace. In the manufacture of lithopone, barium sulphide reacts with zinc sulphate, forming a precipitate designated as a $ZnS\text{-}BaSO_4$ compound of uncertain composition. This white precipitate is calcined and water quenched, preferably in the absence of air. During the calcining, two reactions take place; the first causes the calcining material to turn black and the second reaction changes the black product to the white lithopone.

To better accomplish this purpose the patentee describes a calcining furnace having a heating chamber and a calcining chamber. The calcining chamber consists preferably of a rotary drum of some suitable heat-resisting alloy, such as nichrome or thermalloy, that extends through a heating furnace where heat is applied to the bottom of the rotary kiln, passes upwards and around the kiln through a series of heat passages.

The material is fed into the rotary drum by a ram fed from a suitable hopper, and passes through the heating zone due to the rotation of the kiln, assisted by plow projections on the inside of the kiln. The material is discharged to a stationary, enclosed spout to a water bath. As the metals recommended for construction of this kiln have a high coefficient of expansion, the feed mechanism is mounted on a suitable track and the rollers supporting the drum are designed especially wide. The rolls, ring gear and discharge end are all outside the fire zone.—*James H. Knapp, assignor to Tate Jones & Co.*, October 9, 1928. U. S. Patent No. 1,686,565.



Rotary kiln of heat-resisting alloy for heating out of contact with the material

Traffic and Transportation

Car Loadings of Sand and Gravel, Stone and Limestone Flux

THE following are the weekly car loadings of sand and gravel, crushed stone and limestone flux (by railroad districts) as reported by the Car Service Division, American Railway Association, Washington, D. C.:

CAR LOADINGS OF SAND, GRAVEL, STONE AND LIMESTONE FLUX

District	Limestone Flux Week ended Oct. 6	Limestone Flux Week ended Oct. 13	Sand, Stone and Gravel Week ended Oct. 6	Sand, Stone and Gravel Week ended Oct. 13
Eastern	3,627	3,944	19,029	19,182
Allegheny	4,300	4,143	10,252	11,044
Pocahontas	537	518	1,004	1,067
Southern	623	673	11,511	11,933
Northwestern	1,177	1,223	10,077	9,524
Central western	518	552	11,624	12,197
Southwestern	552	527	7,791	7,884
Total	11,334	11,580	71,288	72,831

COMPARATIVE TOTAL LOADINGS, BY DISTRICTS, 1927 AND 1928

District	Limestone Flux Period to Date 1927 Oct. 15	Limestone Flux Period to Date 1928 Oct. 13	Sand, Gravel and Stone Period to Date 1927 Oct. 15	Sand, Gravel and Stone Period to Date 1928 Oct. 13
Eastern	139,686	122,632	451,835	457,866
Allegheny	146,588	140,505	347,723	305,995
Pocahontas	21,265	19,244	39,688	33,629
Southern	23,924	24,080	499,136	434,417
Northwestern	55,327	54,890	295,924	276,156
Central western	20,759	18,194	388,789	423,440
Southwestern	14,252	17,036	234,937	255,791
Total	421,841	396,581	2,258,032	2,187,294

COMPARATIVE TOTAL LOADINGS, 1927 AND 1928

	1927	1928
Limestone flux	*421,841*	*396,581*
Sand, stone, gravel	*2,258,032*	*2,187,294*

Proposed Changes in Rates

THE following are the latest proposed changes in freight rates up to the week beginning November 3:

SOUTHERN FREIGHT ASSOCIATION DOCKET

42403. **Sand and gravel,** from Ellerslie and Warmore, Va., to destinations in Virginia. It is proposed to establish rates on sand and gravel (See Note 3), from Ellerslie and Warmore, Va., to destination in Virginia on Atlantic Coast Line R. R., Chesapeake & Ohio Ry., Norfolk & Western Ry., Seaboard Air Line Ry., Southern Ry., and Virginian Ry., on basis of the Interstate Commerce Commission Docket 17517 scales.

42457. **Sand, gravel, crushed stone,** etc., carload minimum weight on, to, from and between points in southern territory. It is proposed to amend agency and individual lines' tariffs, publishing rates on sand, gravel, crushed stone, slag, rubble stone, broken stone, chert, carloads, from, to and between points in Southern Freight Association territory, to provide for the following minimum weight:

Minimum weight 90% of the load limit, except where no load limit is shown on the car, 90% of the marked capacity of the car, except where car is loaded to full visible capacity, actual weight shall govern.

42496. **Sand, gravel, crushed stone, etc.,** from southern points to Carrollton, Ky. It is proposed to cancel all rates on sand, gravel, crushed stone, slag, etc., published in Agent Glenn's Tariff 88A, I. C. C. A655, to Carrollton, Ky., and at the same time provide for the application of the joint trunk line scale (Scale 2, page 244) in Agent Glenn's I. C. C. A655, from all origins to Carrollton, Ky. This can be accomplished by showing the C. & W. R. R. with the other carriers published under List No. 1, page 245, of Agent Glenn's I. C. C. A655, and publishing a note in connection therewith, reading: "Applicable only in connection with Scale No. 2, published on page 244, and only on traffic destined to Carrollton, Ky."

42575. **Crushed stone, etc.,** from Virginia points to Southern Ry. stations in Virginia, North Carolina and South Carolina. It is proposed to established reduced rates on **chert, sand, gravel, crushed stone, slag, rubble, stone and broken stone,** in straight or mixed carloads (See Note 3) from Alco, Blue Ridge, Eagle Mountain, Indian Rock, Klotz, Longcor, Longdale, *Lynchburg, Miles, Pembroke, *Reusens, Ripplemead, *Roanoke, Rocky Point and Rostico, Va., to Southern Ry. stations in Virginia, North Carolina and South Carolina south of Lynchburg, Richmond and Norfolk and east of line drawn from Newton, N. C., to Columbia, S. C., on basis of Docket 17517 scales.

Rates from points prefixed by character "" to apply only to points in Virginia.

Statement of representative present and proposed rates will be furnished upon request.

42580. **Sand and gravel** from Johnsonville, Tenn., to Dyer, Tenn. Present rate, 125c per net ton. Proposed intrastate rate on sand and gravel (See Note 3), from Johnsonville, Tenn., to Dyer, Tenn., 115c per net ton, made on basis of Docket 17517 scale.

42,581. **Sand and gravel** from Johnsonville, Tenn., to I. C. R. R. stations, Cades to Hillside, Tenn., inclusive. Lowest combination now applies. Proposed rate on sand and gravel, carloads (See Note 3), from Johnsonville, Tenn., to I. C. R. R. stations, viz., Cades, Idlewild, Bradford, Wade, Greenfield, Sharon and Hillside, Tenn., 105c per net ton, to apply only on intrastate traffic, made in line with rates to other points in the same general territory.

TRUNK LINE ASSOCIATION DOCKET

19746. **Limestone, fluxing,** carloads (See Note 3), from Bethlehem, Penn., to Phillipsburg, N. J., rate 63c per gross ton, subject to Rule 77. Reason—Rates fairly comparable with others involving similar movements.

19747. **Sand,** carloads (See Note 3), from Palmerton, Penn., to Mauch Chunk, Penn., rate 90c per net ton, subject to Rule 77. Reason—Rate fairly comparable with rates involving similar haul.

19759. **Stone, fire; stone, ganister,** carloads (See Note 3), from stations shown in Agent Wilson's A-193, viz.: Granville to Petersburg, Penn., Burnham to Reedsville, Penn., and Lewistown, Penn., to Girard, Lowellville, Niles, Struthers, Youngstown, O., Farrell, Greenville, New Castle, Sharon, Sharpsville, Shenango, Penn., Warren, O., West Middlesex, Wheatland, Penn., Steubenville, Mingo Jct., Martins Ferry, Bridgeport and Bellaire, O., rate of $1.90 per net ton.

19764. **Sand and gravel,** carloads (See Note 3), from Mt. Pleasant and Sea Isle Jct., N. J., to Longport, N. J., rate of $1.04 per net ton. Reason—Rate fairly comparable with others for like movements.

19765. **Sand, engine, foundry, molding, glass, silica, quartz or silex,** carloads, also **gravel,** carloads (See Note 3), from Arundel, Md., to Croome, Md., 80c; to Duley, Cheltenham and Brandywine, Md., 85c; to Mattawoman to La Plata, Md., 90c, and to Port Tobacco to Popes Creek, Md., 105c per net ton. Reason—Rates fairly comparable with others involving similar hauls.

19784. **Stone, crushed,** carloads (See Note 2), from White Haven to Shickshinny, Penn., $1.15 per net ton. Reason—The proposed rates are comparable with rates from White Haven to Nicholson, Penn.

WESTERN TRUNK LINE DOCKET

961A. **Sand and gravel** (See Note 2), except that when weight of shipment loaded to full visible capacity of car is less than 90% of marked capacity of car the actual weight will apply, but in no case shall the minimum be less than 40,000 lb., from Akron, Hawarden and Rock Valley, Ia., to stations in South Dakota, of which the following are representative:

(C. M. St. P. & P.)—To	Pres.	Prop.
Vermillion	4.5	4
Yankton	5	5
Tyndall	7	6.5
Wagner	7.5	7.5
Geddes	8.5	8.5
Mitchell	7.5	7
Armour	8	7.5
Harrisburg	4.5	4
Parker	5.5	4.5
Plankinton	8	7.5

2079G. **Stone, rubble,** carloads (See Note 2), except that when weight of shipment loaded to full visible capacity of car is less than 90% of the marked capacity, the actual weight will apply, but in no case shall the minimum weight be less than 40,000 lb., from Lannon, Wis., to Aurora, Ill. Present rate, $1.58 per net ton, combination on Normantown; proposed, $1.20 per net ton.

496K. Rates and min. wts.: **Limestone, crushed and ground,** carloads, from Weeping Water, Neb., to points in North Dakota and South Dakota. Present rates, class or combination; proposed, establish joint line rates based on scale proposed, of which the following is representative:

Distance	Crushed limestone Via 2 lines	Crushed limestone Via 3 or more lines	Ground limestone Via 2 lines	Ground limestone Via 3 or more lines
5	4.5	5	5	5.5
50	4.5	5	8	8.5
100	7	7.5	10	10.5
150	8.5	9	11.5	12
200	9.5	10	13	13.5
250	10.5	11	14.5	15
300	11.5	12	16.5	17
350	12.5	13	17	17.5
400	13	13.5	19.5	20
450	14	14.5	20.5	21
500	15	15.5	22	22.5

Minimum weights—Present, various; proposed (See Note 2), except when weight of shipment loaded to full visible capacity of car is less than 90% of marked capacity of car, the actual weight will apply. In no case shall the minimum weight be less than 40,000 lb.

496L. **Limestone, crushed and ground,** carloads, from Weeping Water, Neb., to points in Kansas. Present rates, combination; proposed, establish joint line rates based on scale proposed below for representative distances:

Distance	Crushed limestone Via 2 lines	Crushed limestone Via 3 or more lines	Ground limestone Via 2 lines	Ground limestone Via 3 or more lines
5	4.5	5	5	5.5
50	4.5	5	8	8.5
100	7	7.5	10	10.5
150	8.5	9	11.5	12
200	9.5	10	13	13.5
250	10.5	11	14.5	15
300	11.5	12	16.5	17
350	12.5	13	17	17.5
400	13	13.5	19.5	20
450	14	14.5	20.5	21
500	15	15.5	22	22.5

Minimum weights—Present, various; proposed (See Note 2), except when weight of shipment loaded to full visible capacity of car is less than 90% of marked capacity of car, the actual weight will apply. In no case shall the minimum weight be less than 40,000 lb.

496M. **Limestone, crushed or ground,** carloads, from Weeping Water, Neb., to points in Minnesota. Present—As shown in Items 4835 and 4847, W. T. L. Tariff 18M; to other points class or combination rates. Proposed—The same as currently applicable on Nebraska intrastate traffic for joint line movement. Present minimum weights, various; proposed, 90% of the marked capacity of car excepe when weight of shipment loaded to full visible capacity of car is less than 90% of marked capacity of car, the actual weight will apply. In no case shall the minimum weight be less than 40,000 lb.

ILLINOIS FREIGHT ASSOCIATION DOCKET

3098, Sub. 2. **Sand** (not molding nor silica) and **gravel,** carloads, to Chapin, Ill. Rates per net ton:

From	Pres.	Prop.
Aurora, Ill.	$1.51	$1.39
Yorkville, Ill.	1.51	1.39
Sheridan, Ill.	1.51	1.39

4705. **Sand, carloads,** minimum weight to Galva,

Moline, Rock Island, Davenport, St. Louis (See Note 3), to **Galesburg,** 40,000 lb.; to Morris, Peoria (See Note 3), but not less than 40,000 lb.; to St. Louis, 40,000 lb.

To (representative points)	From Chicago, Ill. —Present— Interstate per ton	State per ton	From Chicago, ex lake, when originating at Pigeon Hill, Mich. Proposed, per ton
Galesburg, Ill.	.....	$1.50	$1.14
Moline, Ill.	$2.00	1.90	1.14
Morris, Ill.	.88	.88	.76
Peoria, Ill.	1.64	1.51	.76
Rock Island, Ill.	2.00	1.90	1.14
St. Louis, Mo.	2.18	.....	1.14

4730. **Sand and gravel,** carloads.

From Janesville, Wis.

To	Pres.	Prop.
Lanark, Ill.	80	90
Mt. Carroll, Ill.	80	90
Hickory Grove, Ill.	80	90

From Beloit, Wis.; South Beloit, Ill.

To	Pres.	Prop.
Mt. Carroll, Ill.	80	90
Hickory Grove, Ill.	80	90
Savanna, Ill.	80	90

4732. **Sand and gravel,** carloads, from Clinton, Ill., to Urbana, Ill. Present rates, class; proposed, 98c per net ton.

4741. **Crushed stone,** carloads, from Krause, Ill., to I. C. R. R., deliveries at East St. Louis, Ill. Present rate, 30c; proposed, 24c.

SOUTHWESTERN FREIGHT BUREAU DOCKET

16090. **Sand and gravel,** between Memphis, Tenn., and points in Arkansas. To establish through rate of 5c per 100 lb., plus any switching charge that may be necessary at origin or destination end on sand and gravel, carloads, minimum weight 80,000 lb., or if marked capacity is less than 80,000 lb., marked capacity will govern, from, to and between Memphis, Tenn., and Brinkley-Wheatley, Ark. Shippers have pointed out that there is currently in effect a through rate of 5c per 100 lb. from various points in Arkansas on the Missouri Pacific, St. Louis-San Francisco and C. R. I. & P. Rys. to Memphis, Tenn., which rate is considerably less than it would be under the 9702 scale, and, further, the distances from such points to Memphis, Tenn., range from 21 miles to 123 miles, as compared to the distance between Memphis and Brinkley-Wheatley, Ark., of approximately 69 miles.

TRANSCONTINENTAL FREIGHT BUREAU DOCKET

9341. **Ground limestone,** carloads, W. B.: Request for rate of 50c per 100 lb. on ground limestone, carloads, minimum weight 80,000 lb., from Group "D" to Pacific coast points under Tariff 1-E (I. C. C. Nos. 96, A228, 2116 and 1210 of Frank Van Ummersen, W. S. Curlett, B. T. Jones and H. G. Toll, Agents, respectively) and 4A (I. C. C. Nos. 86, A217, 2074 and 1203 of Frank Van Ummersen, W. S. Curlett, B. T. Jones and H. G. Toll, Agents, respectively).

NEW ENGLAND FREIGHT ASSOCIATION DOCKET

15398, Amended. **Run of bank sand and gravel,** from Lancaster, Mass., to Worcester, Mass., and from Maynard, Topsfield, South Acton, Gleasondale and Littleton, Mass., to Boston, Mass., 50c per ton of 2000 lb. Reason—To meet motor truck competition.

15583. **Sand, blasting, core, fire and sea,** carloads (See Note 2), from New Haven, Conn., to Westfield, Mass., 8c. Reason—To place rate on same basis as other existing commodity rates.

15588. **Stone, broken or crushed,** carloads (See Note 2), from East Wallingford (Redd's Gap Quarry), New Britain (Cook's Quarry), Conn., to Branchville, Conn., 95c per net ton. (Rate will expire November 15, 1928, unless sooner canceled, changed or extended.) Reason—To meet competitive conditions and to allow rate published until the job is completed.

15592. **Stone, broken or crushed,** in bulk in gondola or other open top cars, carloads (See Note 2), from Branford (Pine Orchard Quarry), Rocky Hill and East Wallingford (Reed's Gap Quarry), Conn., to Bellingham Jct., Mass., $1 per net ton. (To expire with November 30, 1929, unless sooner canceled, changed or extended.) Reason—To provide a rate that with compete with local stone.

15596. **Stone, broken or crushed,** carloads, in bulk, in open cars (See Note 2), from East Wallingford and Rocky Hill, Conn., to Deep River, Conn., 70c per ton. (To expire December 31, 1928, unless sooner canceled, changed or extended.) Reason—To provide a rate to compete with native stone.

CENTRAL FREIGHT ASSOCIATION DOCKET

19830. To establish on **sand and gravel,** carloads, Marion, O., to Fostoria, O., rate of 90c per ton of 2000 lb. Present rate, sixth class rate of 240c per ton of 2000 lb.

19831. To cancel commodity rate of 60c per net ton on filling or refuse material, consisting of **sand** from excavations, etc., carloads, Detroit, Mich., to French Landing, Mich. To apply in lieu thereof sixth class basis of 10c.

19835. To establish on **crushed stone,** carloads, White Sulphur, O., to stations on the N. Y. C. R. R. (O. C. L.) shown below, following rates (Rates in cents per net ton):

To	From West Sulphur, O. Current Rate	Proposed Rate
Western Line		
Ridgeway, O.	80	75
Horton, O.	80	70
West Mansfield, O.	80	70
Renner, O.	80	70
Highway, O.	80	75
Pickerington, O.	85	80
Harley, O.	85	80
Basil, O.	85	80
Baltimore, O.	85	80
Thurston, O.	90	80
Pleasantville, O.	90	80
Rushville, O.	90	80
Bremen, O.	90	80
Flagdale, O.	90	80
Junction City, O.	90	80
New Lexington, O.	90	80
Clay Bank, O.	90	80
Moxahala, O.	90	80
Rendville, O.	90	80
Corning, O.	90	80
Eastern Division		
Martel, O.	80	75
Climax, O.	80	75
Fulton, O.	80	70
Marengo, O.	80	70
Pearless, O.	80	70
Rich Hill, O.	80	70
Centerburg, O.	80	70
Hebron, O.	90	80
Lakeside Park, O.	90	80
Millersport, O.	90	80
Thurston, O.	90	80
New Salem, O.	90	80
Western Division		
Fisher, O.	110	90
Hebbardsville, O.	110	90
Albany, O.	110	90
Langsville, O.	120	110
Rutland, O.	120	110
Hobson, O.	120	110
Cheshire, O.	120	110
Addison, O.	120	110
Kananga, O.	120	110
Gallipolis, O.	120	110

19838. To establish on **sand and gravel,** carloads, as described in W. T. L. Tariff 41-O, Lowell, Ill. (Lowell & Southern R. R.), to eastern destinations, same basis of rates as now in effect from Leonore, Ill. Note—Lowell & Southern R. R. to be added as a participating carrier. Present rates, class or combination.

19844. To establish on **sand and gravel,** carloads, from R. A. Junction, O., to D. T. & I. R. R. points in Ohio, rates as shown below. Proposed rates from R. R. Junction, O., in cents per ton of 2000 lb.:

To D. T. & I. R. R.		To D. T. & I. R. R.	
Washington C. H.	95	Jackson	75
Boyds	90	Bloom Junction	90
Good Hope	90	Herbert	90
Ghormleys	90	Hayward	90
Greenfield	85	Andre	90
Thrifton	85	Cornwall	95
Fruitdale	85	Crawford	95
Humboldt	85	Superior	95
Bainbridge	80	Wagner	95
Dills	80	Goldcamp	95
Storms	80	Halley Farm Sw.	100
Spargusville	75	Lisman	100
Harris	75	Pedro	100
Summit	70	Royersville	100
Denver	70	Vesuvius	100
Peck	70	Le Grange	100
Waverly	70	Chapmans	80
Glen Jean	70	Coalton	80
Givens	70	Glen Roy	80
Robbins	70	Wellston	80
Beaver	70	Ratchford	85
Glade	70	Lincoln	85
Cove	70	Cornelia	85
Rottinghouse Switch	70	Lawrence	100
Hammertown Switch	75	Bartles	100

Present rate, sixth class, R. A. Junction being intermediate to Columbus and Gregg, O.

19857. To establish on **sand** (all kinds) and **gravel,** carloads, from Krumroy, O., to North Dover, O. (N. Y. C. & St. L.)—Proposed rate, 85c; present rate, 120c. Avon, O. (N. Y. C. & St. L.)—Proposed rate, 90c; present rate, 120c. (In cents per 2000 lb.)

19862. To establish on **crushed stone,** carloads, Glass Rock, O., to Philo, O., 70c per net ton. Present rate, sixth class.

19864. To establish on **crushed stone,** carloads, from Spore, O., to following Ohio points (rates in cents per net ton):

To	*Prop.	To	*Prop.
Barnesville	125	Lore City	125
Bellaire	145	Neffs	135
Cambridge	115	Quaker City	125
Cumberland	†145	Salesville	125
Eldon	125	Sonora	115
Glencoe	135	Warnock	135

*Present, class rates.

†20c over Lore City, regularly established basis to this point.

19870. To establish on **pulverized or ground limestone,** carloads, Sibley, Mich., to Peoria, Ill., 14c. Present rate, 15½c.

19882. To establish on **crushed stone,** in bulk, in open cars, also **crushed stone screenings,** in bulk, in open cars, carloads, from Kenneth and Kokomo, Ind., to Penn. R. R. stations:

	Prop.	Pres.	Prop.	Pres.
Anderson, Ind.	85	100	70	85
Greensfork, Ind.	....	.....	90	115
Richmond, Ind.	....	.....	95	115

Cement Overcharges to Florida

QUESTIONS of tariff interpretation occasioned the dispute involved in docket 21267, Signal Mountain Portland Cement Co. against the A. G. S. and others, according to the testimony introduced at the hearing at Chicago, October 27, before Examiner Disque. The case involves alleged overcharges on cement in carloads shipped from Chattanooga, Tenn., to points in Florida south of Jacksonville between June 1, 1925, and April 14, 1928.

According to the testimony of J. B. Johnson, general traffic manager of the complainant, the rates charged were in violation of the aggregate of the intermediates' clause of the fourth section of the interstate commerce act. He contended for combinations based on Fernandino, Milldale and Eastport, Fla., which, he said, were, in some instances, as much as 20 cents a ton less than the through rates charged. In his opinion, portions of the tariffs involved were conflicting and ambiguous, and he said the rule was to find against the framers in such instances.

For a period of time covered by the complaint, the situation, as explained, was that one tariff named rates to Florida points from Jacksonville and said they would apply from Fernandino, Milldale and Eastport. Another tariff specified that on traffic originating at Chattanooga, among other points, the Jacksonville rates would not apply. The position of the complainant witness was that the restriction did not preclude use of the rate from Milldale, etc. According to the carrier witnesses, the points named, from which the Jacksonville rates were to apply, were nothing more than industrial points at Jacksonville, and the restriction in the one tariff with reference to the Jacksonville rates precluded basing a combination on the other points. Attention was called to the fact that the period covered by the complaint was, in part, that of the so-called Florida boom and that there had been a large volume of movement. No other shipper of cement had made an effort to defeat the rates as charged, it was said.—*Traffic World.*

Seattle's Gypsum Industry Is Prosperous

THE STANDARD GYPSUM CO.'S Seattle, Wash., plant will be three years old December 1. Its business in this third year is running 60% ahead of the first two years. Output for September here was 3500 tons of plaster, or 70% of capacity.

Interesting as is the story of this company's struggle for business and a foothold in the northwest, it is no less so than the collateral enterprises that it has fostered. Among these is the Alaska-Mexico Transportation Co., which runs three ships between this and Mexican ports, the first direct and steady connection between Seattle and Mexico.

Seattle, Everett and Tacoma stockholders control Standard Gypsum Co., capitalized for $2,000,000, with no bonds. It also owns plants at Long Beach, Calif., 7500 tons a month capacity, and at Ludwig, Nev., 10,000 tons capacity. The two coast plants, manufacturing plaster, obtain their gypsum rock from lower California, where the company has a concession from the Mexican government.

The three vessels of the Alaska-Mexico Transport Co., *S. A. Perkins,* 8000 tons; *James Griffith,* 6000 tons, and *El Sedro,* 4000 tons, come north with gypsum rock and take back to Mexico and ports all the way to Panama lumber, merchandise and such northwest products as there is a market for.

Besides what the Seattle gypsum plant uses, rock is brought here and ground for three cement plants in this state and one in Oregon, going by rail from Harbor Island to Concrete, Bellingham, Grotto and Oswego, Ore.

The company's 7-acre site on Harbor Island cost $65,000 and $20,000 was expended in dredging to raise the surface 5 ft. The plant itself cost $250,000. It is automatic throughout and is said to be one of the most modern and efficient plaster mills in the country. It operates with 16 men, whereas a few years ago such an output would have required about 60 men. Office and sales forces require nine more persons.

Now that the Seattle enterprise is over the hump, so to speak, and is going strong, it may be related that this was accomplished despite great difficulties and much opposition. Building material dealers here had brands of plaster of their own to push. Naturally they resisted a newcomer. The local plant had to secure the co-operation of building owners, architects and contractors. A list of buildings here that have been finished with this Seattle-made, hard-wall plaster reads like a roster of the finest and most modern structures in the city.

S. A. Perkins of Tacoma is chairman of the board, on which John W. Eddy and John R. Holmes are directors. Other stockholders include Joshua Green, R. P. Greer, Sam Hedges, James G. Eddy and Stanley L. Eddy. It is a closed corporation. Martin Uldall is president and W. S. Keith is manager of the Seattle operations.

Mr. Keith avers that this Seattle-made plaster is equal in quality to any in the world and stands ready, he says, to prove it. The gypsum rock from which it is made is declared to be of such rare quality that it is being sought in increasing quantities in Japan and China, to which countries shipments are being made.

The product of the local mill is obtaining favor with builders all over the state.

It is said that when the project of establishing this plant here was broached, it received its first backing from John W. Eddy, who subscribed $50,000 at the outset and more subsequently. He is also said to have worked energetically since then to obtain business for it.

There is, of course, ample competition for Standard Gypsum Co. to grapple with, but it seems to have battled its way to a strong position in the local building industry, and future success is not in doubt.—L. E. HILL, financial editor, *Seattle* (Wash.) *Post-Intelligencer.*

New Rock Products Industry for Montana

A MANUFACTURING PLANT for the Vermiculite and Asbestos Co., of Libby, Mont., is now under construction on a site in the eastern part of the city near the Great Northern railway, and it is expected to have the plant in operation by about December 1. The new plant is being built for the company by Frank Pival, local builder and contractor.

This new manufacturing establishment is to be equipped with a Ruggles-Cole calciner, with a capacity sufficient to calcine and dry from 20 to 30 tons of vermiculite and asbestos per day. Briefly, the calcining machine consists of two horizontal tubes, one within the other, the machine being about 30 ft. long. The heat passes through the inner tube, while the product travels in the space between the inner and outer tubes, the two tubes revolving. The flame does not come in contact with the product.

The raw product will first be crushed to desired size suitable for treating and then will be passed through the calciner, after which it will go through a pulverizer. The product will then be separated into the various sizes and classifications by air separation. It is planned to make the plant dustproof.

An office and laboratory are also being built at the plant, with the laboratory completely equipped for research work.

The company is preparing to produce some novel and interesting products from vermiculite and asbestos, believing that there is a large market awaiting these products.

The company will have associated with them M. H. Kauffman of Denver, Colo., a trained metallurgical chemist. Mr. Kauffman is a graduate of the Massachusetts Institute of Technology and was formerly superintendent of the Durango, Colo., smelter of the American Smelting and Refining Co. and later had charge of the chemical laboratory of the Western Research Corp. of Denver. Mr. Kauffman is now in Libby to assist in the organizing of the plant.

Sodium Sulphate Shipments Begin from Washington State Quarry

SHIPMENT of the first carload of sulphates from the deposits on the reservation near Okanogan, Wash., was made recently by the 99 Co., which has leased the holdings of the Naso Chemical Co. For the present the sulphates are being shipped to the 99 Co.'s plant in Seattle, where slight impurities are being extracted. The company takes its name from the fact that the salts are 99% pure sodium sulphate.

The 99 Co. is making no statements of its future policies. It is concerned, for the present, with working out certain problems of production and putting its product in its plant. A visit to the Cameron Lake region recently, where the company is operating at present, showed several men at work removing the salt blocks from beds at the bottom of a dried lake. There are large numbers of such lakes on the reservation; they have small amounts of water in the spring but dry up during the summer. The precipitations gather in pockets and settle, a chemical reaction taking place which changes them into crystal form. Pressure from above cakes these crystals into solid blocks. These blocks are mined with picks and crowbars, being broken into chunks which somewhat resemble concrete blocks. These cakes are almost pure sodium sulphate; in fact, the lakes on the reservation have the purest deposit of this sulphate known to exist in the United States.

At the present time only the solidly compressed crystal blocks are being removed from the lake. These are brought to Okanogan by truck and loaded in bulk into the box cars. Mr. Smith, representative of the 99 Co., is actively in charge of work at the lake. The salts at the top of the pockets are glober salts and have a high percentage of water content. Before these can be put on the market their water content must be removed. At the present time these salts of a high water content are being stacked on the banks of the lake.

According to R. Stenwick, president of the company, the market for sodium sulphate is almost limitless. Over 500,000 tons of the product were imported into the United States last year from Germany. It is used in the manufacture of paper, rayon silk, glass, varnishes and countless other products. It gives toughness to paper and to rayon silk, is used in glass manufacture to prevent bubbling and to give toughness, and is used in varnishes to give a sheen to the finished product.—*Okanogan* (Wash.) *Independent.*

Cement Products

Manufacture of Manhole Block Allied with Concrete Pipe Business

Mid-West Concrete Pipe Co., Franklin Park Ill., Carries on a Profitable Side Line

By T. A. Day
Cement Products Bureau, Portland Cement Association

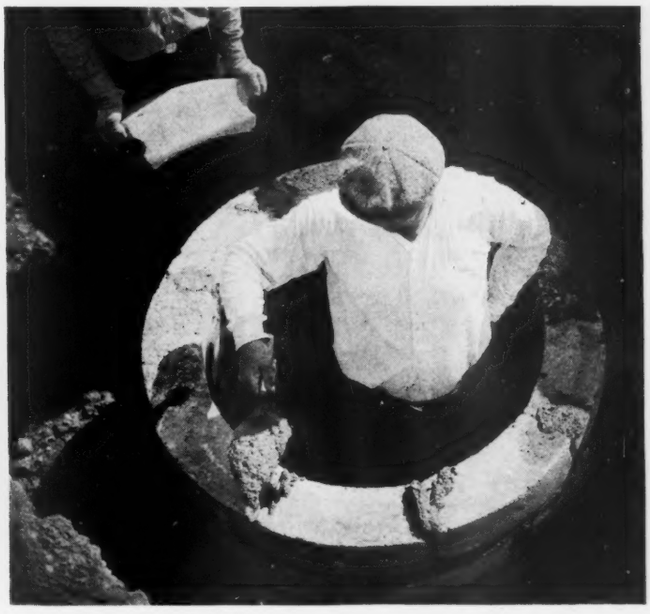
PROFITING by the excellent contacts its field forces have with engineers and contractors in the sewer building field, the Mid-West Concrete Pipe Co. of Franklin Park, Ill., has developed a profitable allied business in a short period of time. This extra enterprise is the manufacture and merchandising of concrete manhole and catch basin block. Every concrete pipe job has been found to be a potential market for these radial units.

Established only a few years ago, this company has furnished units for building manholes and catch basins on many important sewer jobs in Chicago and vicinity. Several of the principal sewer projects furnished were the new Cicero avenue sewer, Chicago, and systems in Lansing and Calumet City, while the sewer work of the Sanitary District of Chicago also required many manhole block supplied by the Mid-West company. Among the other Illinois cities and towns which have used or are using radial concrete block manufactured by this company are Broadview, Chicago Heights, Crete, Deerfield, Des Plaines, Elmwood Park, Forest View, Franklin Park, Glencoe, Hazelcrest, Highland Park, Libertyville, Markham, Melrose Park, Mount Prospect, Mundelein, Palatine, River Grove, Schiller Park, Steger, Stickney, Tessville, Wheaton, Wilmette and Winnetka, Illinois.

Three Indiana municipalities—Gary, Hobart and Logansport—are also included in the Mid-West company's list of satisfied customers.

The plant is located on Grand avenue between the Indiana Harbor Belt Line tracks and Soo Line tracks, Franklin Park, Ill. Location at this site permits the factory to receive raw materials in carload lots. Good roads, radiating in all directions, provide excellent facilities for truck deliveries of plain or reinforced concrete sewer, drain or culvert pipe and manhole block to the jobs for which the company furnishes material.

Placing grooved manhole block furnished by the Mid-West company



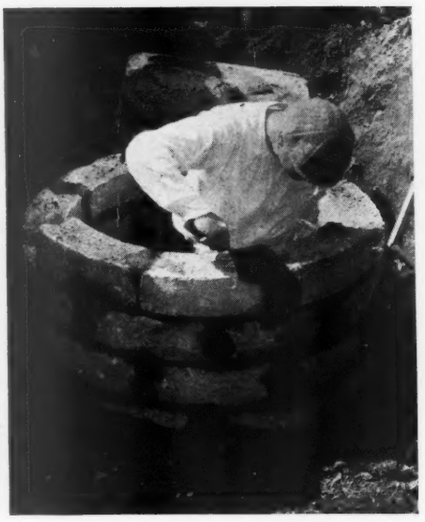
Filling core holes, formed by the grooved ends of adjacent block, to make a watertight vertical joint

When necessary, long distance shipments are also made by rail.

Howard Schurmann is president of the company, but C. H. Bullen, vice-president, treasurer and general manager, is in active charge of manufacturing and sales. Frank Novotny is secretary of the organization. R. C. Graber is the plant superintendent. Both Messrs. Bullen and Graber were active in the concrete pipe business on the Pacific coast before coming to the middle west several years ago. The company, in addition to its pipe plant, manhole block factory and office at Franklin Park, also maintains a sales office in Chicago in charge of Mr. Novotny.

The type of unit manufactured is known as the "grooved block" and is made on a stripper machine, the concrete being fed into a steel mold box from a hopper and then compacted by power-tamping. After the units are stripped, the wooden pallets containing the block are sent to curing chambers by means of a continuous conveyor, shown in an accompanying illustration. Bevel block, which are used to start the "cone" or upper part of a manhole, are made on the same machine by inserting a "filler" in the bottom of the mold box.

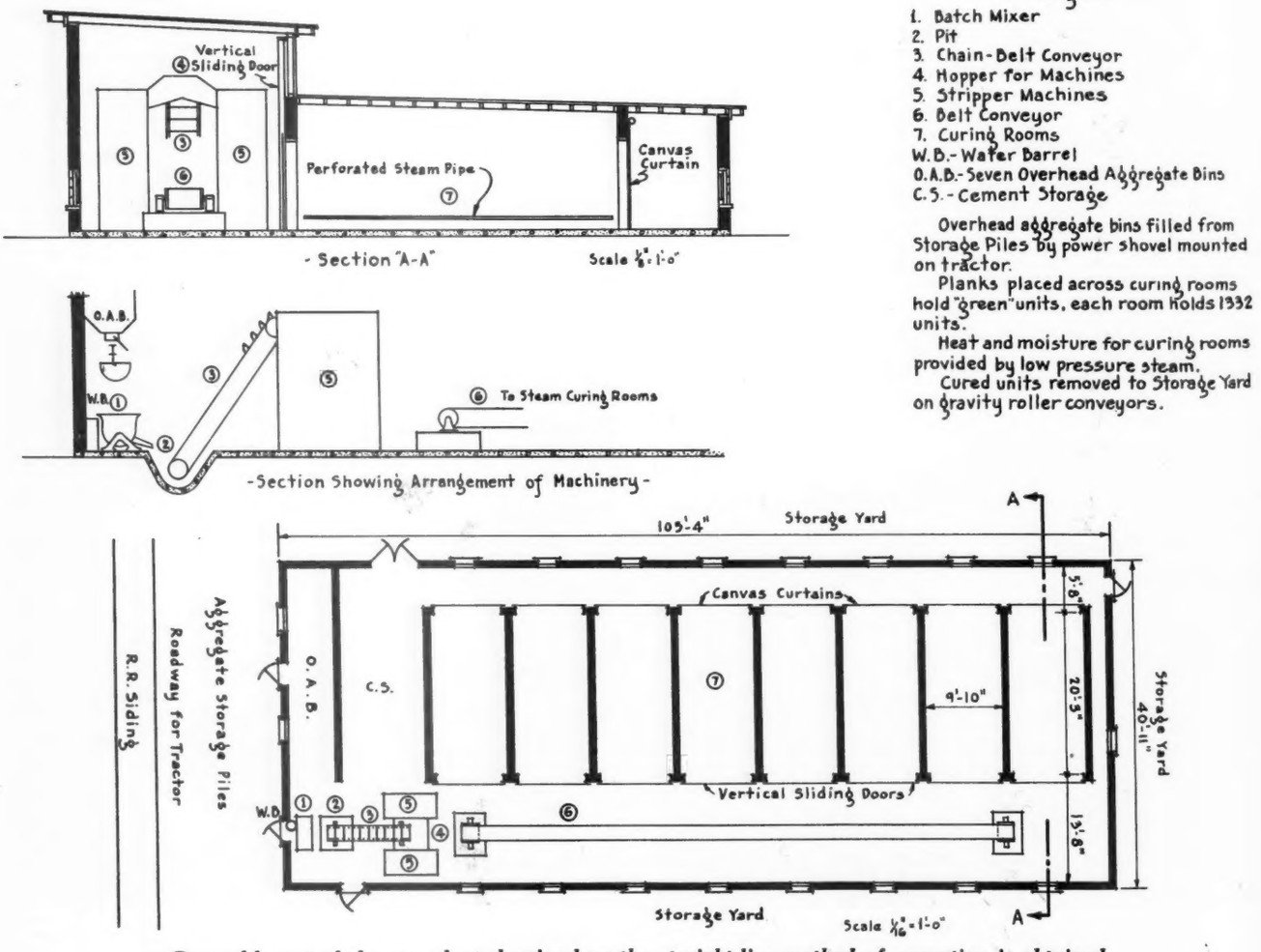
This plant has an average daily production of 1500 block with only one of its two stripper machines in operation. There are adequate facilities for curing and storage. The modern factory building, which has concrete masonry walls, houses eight curing rooms and the storage space available permits the manufacturer to produce enough units so that it is practically impossible to deliver "green" block. Live, low-pressure steam is used for curing and the units remain in the curing chambers for at least 48 hours. Freshly made units are handled by a moving belt, while cured units are carried from the curing rooms to the yard by means of movable, gravity roller conveyors. A minimum of labor is required—one mixer man, one machine operator (two whenever both machines are used), one off-bearer and two yard men. Overhead storage bins are used for the sand and gravel aggregates, while sacked cement is stored on a concrete floor adjacent to the manhole block machines and within easy reach of the mixer man.



Pointing the outside mortar joints in a 36-in. concrete block manhole

Manufacturing is continued throughout the winter months to build up stockpiles which will later meet the demand in the spring. In winter, mixing water is heated with live steam. The water is ordinarily hot enough to remove the traces of frost which occasionally may be found in the aggregate.

As part of its merchandising campaign, the company issues a printed circular on manhole block which has promotive as well as technical value. First of all, it gives the specifications for individual concrete man-

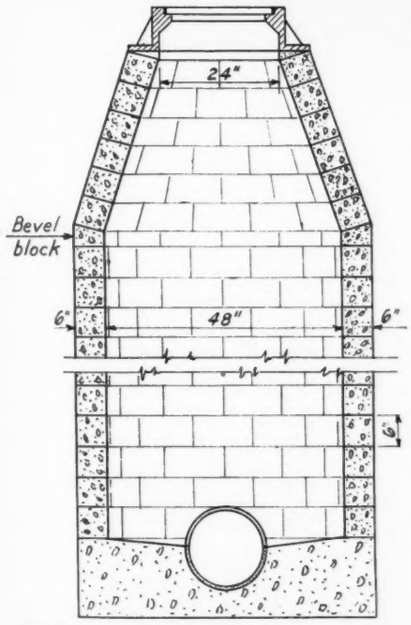


General layout of the new plant showing how the straight-line method of operation is obtained

hole and catch basin block which conform to the requirements of the American Concrete Institute for compressive strength and absorption. (Incidentally, this company takes pride in producing high quality concrete pipe and manhole block.) In addition, the circular pictures a typical section of a block manhole that is similar to the accompanying manhole drawing. Estimating data is also given, including the number of block per course, number of block per foot of height, number of bevel block for one manhole, height in feet of "cone" above beveled course, number of block in "cone," weight of one straight block and weight of one bevel block.

Nine block are required to complete the circle in manholes of 36-in. inside diameter. Twelve block are required for each course in 48-in. structures. Standard units weigh 37 lb. Bevel block weigh 24 lb.

When block of this type are used in building sewer appurtenances, the units of each course are laid in full beds of portland cement mortar and the core holes formed by



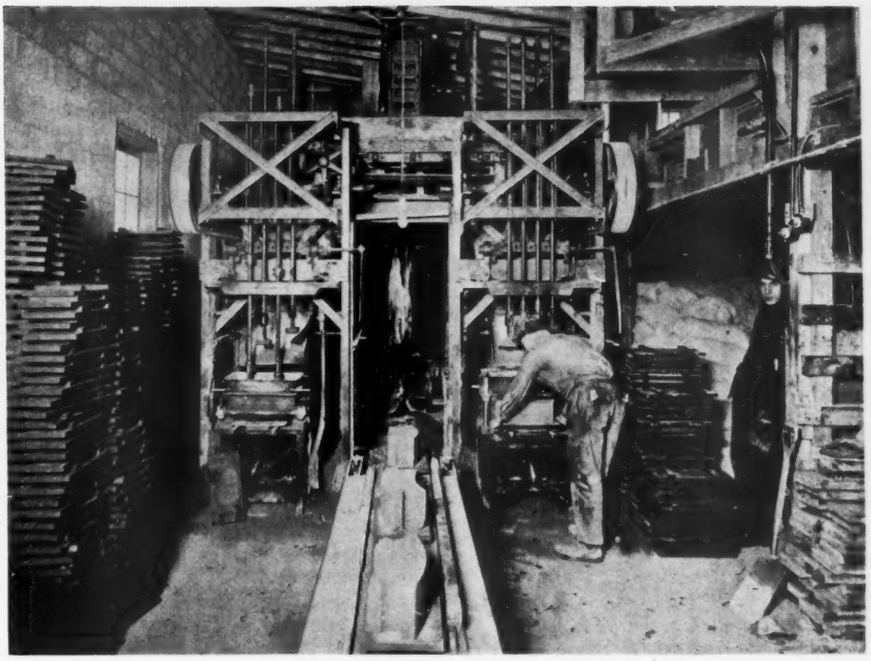
Typical concrete block manhole, illustrating use of standard units for the "cone" portion. Only one course of bevel block is required

ends of adjacent units are filled with soft mortar. When standard units placed on top of one course of bevel block are used to "draw in" the manhole, as shown in the manhole drawing, each course requires one less unit than the course below. At the top, a reverse bevel may be used or a ring of stiff mortar placed to level off the top course.

Whispering Campaigns

(Contributed)

IN recent months considerable publicity has been given a "whispering campaign" which has invaded the realm of politics. From all directions strong editorial comments are being published on the subject and the consensus of opinion seems very definite against it.



Strippers used in producing manhole block. Note the conveyor belt for taking the block from the machines

Underhanded, insidious, unsubstantiated propaganda, whether it be directed against a political party, an individual or some institution, usually reacts as a boomerang to those who are responsible for its propagation. Eventually slander will always be brought out into the light and the position of those against whom it was made is strengthened rather than weakened.

In the business world there have always been individuals and organizations who resort to such methods in an attempt to weaken or destroy their competitors, and no doubt there will always be new ones springing up to take their place when they have passed on. But the day is coming when propagandists of this sort will find it impossible to have their material printed in responsible papers.

Many trade associations, better business bureaus and similar organizations, each organized for the purpose of improving and extending business relations, have been developed in recent years. It is a certainty that no part of this purpose was ever meant to be devoted to "whispering campaigns," yet in the building materials field this sort of thing has been taking place.

We find that catastrophes such as the Florida hurricanes are being capitalized to promote a particular product. The wildest kind of claims and reports have been issued regarding failures of competing materials.

There is nothing constructive about such propaganda—its purpose is to destroy, not to build. No definite recommendations are made for better construction methods. There is any amount of authentic material on file in the form of photographs and reports from authoritative sources that could be used to refute the "whispered propaganda," but it is scarcely worth while, for unfounded information will in time strike back at its source.

In practically every case where a severe storm or similar catastrophe has visited a community, it has been found afterwards that buildings properly designed and constructed with standard quality materials have come through with comparatively small amount of damage. Reports have been published by reputable engineers who made impartial investigations of such disasters as the tornado that swept across southern Missouri, Illinois and Indiana in the spring of 1925, the disastrous Miami hurricane of 1926, the death-dealing twister that struck St. Louis in 1927, and the recent hurricane at Palm Beach, Fla.

These reports show that in sections where concrete masonry predominated failures took place only where the material was below standard quality and the design and construction of the building were poor, and again in those localities predominating in buildings of clay products and lumber construction, failures were from like reasons.

The true value of such information will be lost, however, unless builders carefully study it in an effort to learn how to improve construction methods so that buildings in the future will withstand the ravages of storms.

It is this sort of information that should be circulated by trade associations, responsible magazines and newspapers, and individuals vested with authority to speak. Everyone stands to gain through constructive criticism of this nature—the building material interests, community, and owners.

We anticipate the day when responsible trade magazines and other publications will refuse to print propaganda of a destructive nature, based upon capitalization of disasters.

The Rock Products Market

Wholesale Prices of Crushed Stone

Prices given are per ton, F.O.B., at producing point or nearest shipping point

Crushed Limestone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
EASTERN:						
Buffalo, N. Y.	1.30	1.30	1.30	1.30	1.30	1.30
Chaumont, N. Y.	.50	1.75	1.75	1.50	1.50	1.50
Chazy, N. Y.	.75	1.75	1.60	1.30	1.30	1.30
Dundas, Ont.	.53	1.05	1.05	.90	.90	.90
Farmington, Conn.	.....	1.30	1.10	1.00	1.00	.....
Frederick, Mo.	.50– .75	1.35–1.45	1.15–1.25	1.10–1.20	1.05–1.15	1.05–1.10
Ft. Springs, W. Va.	.40	1.35	1.30	1.25	1.20	.....
Munns, N. Y.	.75	1.25	1.25	1.10	1.00	.....
Prospect, N. Y.	.85	1.15	1.15	1.15	1.15	.....
Rochester, N. Y.—Dolomite	1.50	1.50	1.50	1.50	1.50	1.50
St. Vincent de Paul, Que. (n)	.75	1.35	1.15	.95	.85	1.20
Walford, Penn.	.....	.....	1.35h	1.35h	1.35h	1.35h
Watertown, N. Y.	1.00	1.75	1.75	1.50	1.50	1.50
Western New York	.85	1.25	1.25	1.25	1.25	1.25
CENTRAL:						
Afton, Mich.	.....	.....	.....	.....	.50	1.50
Alton, Ill.	1.85	.....	1.85	.....	.....	.....
Columbia and Krause, Ill.	1.05–1.40	.95–1.50	1.15–1.50	1.05–1.50	1.05–1.50	.....
Cypress, Ill.	1.00–1.25	1.00–1.25	1.20–1.25	1.20–1.25	1.20–1.25	1.35
Davenport, Iowa (f)	1.00	1.50	1.50	1.30	1.30	1.40
Dubuque, Iowa	.85	1.00	1.10	1.10	1.10	1.10
Stolle and Falling Springs, Ill.	1.05–1.40	.95–1.50	1.15–1.50	1.05–1.50	1.05–1.50	.....
Greencastle, Ind.	1.25	1.05	1.05	1.05	.95	.95
Lannon, Wis.	1.00	1.00	1.00	.90	.90	.90
McCook, Ill.	1.00	1.25	1.25	1.25	1.25	1.25
Marblehead, Ohio (l)	.55	.80	.80	.80	.80	.80
Milltown, Ind.	.....	.90–1.00	1.00–1.10	.90–1.00	.85– .90	.85– .90
Northern Ohio points	.85–1.15	1.25	1.15	1.15	1.15	1.15
Sheboygan, Wis.	1.10	1.10	1.10	1.10	1.10	1.10
Stone City, Iowa	.75	.....	1.20	1.10	1.00	.....
Thornton, Ill.	.90	1.00	1.25	1.25	1.25	1.25
Toledo, Ohio	1.60	1.70	1.70	1.60	1.60	1.60
Toronto, Canada (m)	2.50	3.00	3.00	2.85	2.85	2.85
Valmeyer, Ill. (fluxing limestone)	.90–1.20	.....	.....	1.75	.....	1.75
Waukesha, Wis.	1.10	.....	.90	.90	.90	.90
Winona, Minn.	1.00	1.20	1.30	1.40	1.40	1.40
Wisconsin points	.50	.....	1.00	.90	.90	.....
Youngstown, Ohio	.70j	1.25l–1.35h	1.25l–1.35h	1.25l–1.35h	1.25l–1.35h	1.25l–1.35h
SOUTHERN:						
Cartersville, Ga.	1.20	1.65	1.65	1.45	1.15	1.15
Chico, Tex.	1.00–1.40	.50–1.25	1.20	1.10	1.00	.90
Cutler, Fla.	.50– .60r	.....	.....	1.75r	1.10–1.50r	.....
El Paso, Tex.	.50– .75	.50– .75	.50– .75	1.00–1.50	1.00–1.25	.75–1.00
Graystone, Ala.	Crusher run, screened, $1 per ton					
Kendrick and Santos, Fla.	3½ in. and less, $1 per ton					
Olive Hill, Ky.	.50–1.00	1.00	1.00	.90	.90	.90
Rocky Point, Va.	.50– .75	1.40–1.60	1.30–1.40	1.15–1.25	1.10–1.20	1.00–1.05
WESTERN:						
Atchison, Kan.	.50	1.80	1.80	1.80	1.80	1.80
Blue Springs and Wymore, Neb.	.25	1.45	1.45	1.35c	1.25d	1.20
Cape Girardeau, Mo.	1.25	.....	1.25	1.25	1.00	.....
Rock Hill, St. Louis, Mo.	1.00	1.25	1.25	.90–1.25	.90–1.25	.90–1.25
Sugar Creek, Mo.	.75	1.00	1.20	1.20	1.20	1.20

Crushed Trap Rock

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Birdsboro, Penn. (q)	1.20	1.60	1.45	1.35	.....	1.30
Branford, Conn.	.80	1.70	1.45	1.20	1.05	.....
Eastern Maryland	1.00	1.60	1.60	1.50	1.35	1.35
Eastern Massachusetts	.85	1.75	1.75	1.25	1.25	1.25
Eastern New York	.75	1.25	1.25	1.25	1.25	1.25
Eastern Pennsylvania	1.10	1.70	1.60	1.50	1.35	1.35
Knippa, Tex.	2.50	2.25	1.75	1.25	1.25	1.25
New Britain, Plainville, Rocky Hill, Wallingford, Meriden, Mt. Carmel, Conn.	.80	1.70	1.45	1.20	1.05	.....
Northern New Jersey	1.35–1.40	2.00–2.10	1.80–1.90	1.40–1.50	1.40–1.50	.....
Richmond, Calif.	.75	.....	1.00	1.00	1.00	.....
Spring Valley, Calif.	.90–1.25	.90–1.25	.90–1.25	.90–1.25	.90–1.25	.90–1.25
Springfield, N. J.	1.40	2.00	1.90	1.50	1.50	.....
Toronto, Canada (m)	.....	5.80	.....	4.05	.....	.....
Westfield, Mass.	.60	1.50	1.35	1.20	1.10	.....

Miscellaneous Crushed Stone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Berlin, Utley, Montello and Red Granite, Wis.—Granite	1.80	1.70	1.50	1.40	1.40	.....
Cayce, S. C.—Granite	.....	.....	1.75	1.75	1.60	.....
Eastern Pennsylvania—Sandstone	1.35	1.70	1.65	1.40	1.40	1.40
Eastern Pennsylvania—Quartzite	1.20	1.35	1.25	1.20	1.20	1.20
Emathla, Fla.—Flint rock	1.00	.....	2.35	.....	.....	.....
Lithonia, Ga.—Granite	.75a	2.00b	1.75	1.40	1.35	1.25
Lohrville, Wis.—Granite	1.65	1.70	1.65	1.45	1.50	.....
Middlebrook, Mo.	3.00–3.50	.....	2.00–2.25	2.00–2.25	.....	1.25–3.00
Richmond, Calif.—Quartzite	.75	.....	1.00	1.00	1.00	.....
Somerset, Penn. (sand-rock)			1.50 to 1.85			
Toccoa, Ga.	1.40	1.40	1.40	1.30	1.25	1.25

(a) Sand. (b) to ⅛ in. (c) 1 in., 1.40. (d) 2 in., 1.30. (e) Price net after 10c cash discount deducted. (f) 1 in. to ¼ in., 1.45; 2 in. to ¼ in., 1.35. High calcite fluxing stone, 1.50. (h) Less 10c discount. (j) Less 10% net ton. (l) Less .05. (m) Plus .25 per ton for winter delivery. (n) Crusher run for ballast, .85. (p) Carload prices. (q) Crusher run, 1.40; ¼-in. granolithic finish, 3.00. (r) Cubic yard.

Agricultural Limestone

(Pulverized)

Alton, Ill.—Analysis, 98% $CaCO_3$, 0.01% $MgCO_3$; 90% thru 100 mesh	6.00
Bettendorf and Moline, Ill.—Analysis, $CaCO_3$, 97%; 2% $MgCO_3$; 50% thru 100 mesh, 1.50; 50% thru 4 mesh	1.50
Blackwater, Mo.—100% thru 4 mesh	1.00
Branchton, Penn.—Analysis, 94.89% $CaCO_3$; 1.5% $MgCO_3$; 50% thru 100 mesh	3.50–5.00
Cape Girardeau, Mo.—Analysis, $CaCO_3$, 94½%; $MgCO_3$, 3½%; 90% thru 50 mesh	1.50
Cartersville, Ga.—50% thru 50 mesh	1.50
Pulverized, per ton	2.00
Chaumont, N. Y.—Pulverized limestone, bags, 4.00; bulk	2.50
Cypress, Ill.—Analysis, 88% $CaCO_3$; 10% $MgCO_3$; 50-90% thru 4 mesh	1.25
50-90% thru 100 mesh	1.35
Danbury, Conn., and West Stockbridge, Mass.—Analysis, 90% $CaCO_3$; 5% $MgCO_3$; fine ground, 90% thru 100 mesh; bulk	3.50
Paper bags	4.75
100-lb. cloth bags	5.25
(All prices less .25 cash 15 days)	
Davenport, Ia.—Analysis, 97% $CaCO_3$; 2% and less $MgCO_3$; 90% thru 200 mesh, bags, per ton	6.00
90% thru 20 mesh, bulk, per ton	1.50
Hillsville, Penn.—Analysis, 94% $CaCO_3$; 1.40% $MgCO_3$; 75% thru 100 mesh; sacked	5.00
Hot Springs and Greensboro, N. C.—Analysis, $CaCO_3$, 98-99%; $MgCO_3$, 42%; pulverized; 67% thru 200 mesh; bags	3.95
Bulk	2.70
Jamesville, N. Y.—Analysis, 89% $CaCO_3$, 4% $MgCO_3$; pulverized; bags, 4.25; bulk	2.75
Joliet, Ill.—Analysis, 52% $CaCO_3$; 42% $MgCO_3$; 50% thru 100 mesh	2.50
90% thru 100 mesh	3.50
Knoxville, Tenn.—80% thru 100 mesh; bags, 3.95; bulk	2.70
Marlbrook, Va.—Analysis, 80% $CaCO_3$; 10% $MgCO_3$; bulk	1.75
Marl—Analysis, 95% $CaCO_3$; 0% $MgCO_3$; bulk	2.25
Marion, Va.—Analysis, 90% $CaCO_3$, 2% $MgCO_3$; per ton	2.00
Middlebury, Vt.—Analysis, 99.05% $CaCO_3$; 90% thru 50 mesh; bulk, 4.00; paper bags	5.00
Milltown, Ind.—Analysis, 94.50% $CaCO_3$, 33% thru 50 mesh, 40% thru 50 mesh; bulk	1.35–1.60
Olive Hill, Ky.—50% thru 4 mesh	1.00
90% thru 100 mesh	2.00
Piqua, Ohio—Total neutralizing power 101.12%; 99% thru 10, 60% thru 50; 45% thru 100	2.50
100% thru 10, 90% thru 50, 70% thru 100; bags, 5.00; bulk	3.50
100% thru 4, 30% thru 100, bulk	1.50
Rocky Point, Va.—Analysis, $CaCO_3$, 97%; $MgCO_3$, 75%; 50% thru 200 mesh, burlap bags, 3.50; paper, 3.25; bulk	2.00
Watertown, N. Y.—Analysis, 96-99% $CaCO_3$; 50% thru 100 mesh; bags, 4.00; bulk	2.50

Agricultural Limestone

(Crushed)

Bedford, Ind.—Analysis, 98% $CaCO_3$; 1%, $MgCO_3$; 90% thru 10 mesh	1.50

(Continued on next page)

Agricultural Limestone

Chico and Bridgeport, Tex. — Analysis, 95% $CaCO_3$; 1.3% $MgCO_3$; 50% thru 4 mesh 1.00

Davenport, Ia.—Analysis, 97% $CaCO_3$; 2% and less $MgCO_3$; 90% thru 10 mesh, per ton 1.25
90% thru 4 mesh, per ton 1.10

Dubuque, Iowa—50% thru 50 mesh ..... .85

Dundas, Ont.—Analysis, 54% $CaCO_3$; $MgCO_3$, 43%; 50% thru 50 mesh 1.00

Ft. Spring, W. Va. — Analysis, 90% $CaCO_3$; 90% thru 50 mesh 1.00

Kansas City, Mo.—50% thru 100 mesh 1.00

Lannon, Wis.—Analysis, 54% $CaCO_3$, 44% $MgCO_3$; 99% thru 10 mesh; 46% thru 60 mesh 2.00
Screenings (¼ in. to dust) 1.00

Marblehead, Ohio—90% thru 100 mesh 3.00
90% thru 50 mesh 2.00
90% thru 4 mesh 1.00

McCook, Ill.—90% thru 4 mesh ..... .90

Middlepoint, Bellevue, Bloomville, Kenton and Whitehouse, Ohio; Monroe, Mich.; Bluffton, Greencastle and Logansport, Ind.—85% thru 10 mesh, 20% thru 100 mesh 1.50

Moline, Ill., and Bettendorf, Iowa—Analysis, 97% $CaCO_3$, 2% $MgCO_3$; 50% thru 100 mesh; 50% thru 4 mesh 1.50

Mountville, Va. — Analysis, 76.60% $CaCO_3$; $MgCO_3$, 22.83%, 100% thru 20 mesh; 50% thru 100 mesh, paper bags, 4.50; burlap bags 5.00

Stolle and Falling Springs, Ill.—Analysis, 89.9% $CaCO_3$, 3.8% $MgCO_3$; 90% thru 4 mesh 1.10–1.70

Stone City, Iowa — Analysis, 98% $CaCO_3$; 50% thru 50 mesh ..... .75

Waukesha, Wis.—90% thru 100 mesh, 4.50; 50% thru 100 mesh 2.15

Valmeyer, Ill.—Analysis, 96% $CaCO_3$, 2% $MgCO_3$; 100% thru 10 mesh 1.10–1.70

Pulverized Limestone for Coal Operators

Davenport, Ia.—Analysis 97% $CaCO_3$; 2% and less $MgCO_3$; 100% thru 20 mesh, 50% thru 200 mesh; paper sacks 6.00

Hillsville, Penn., sacks, 4.50; bulk 3.00

Joliet, Ill.—Analysis, 52% $CaCO_3$; 42% $MgCO_3$; 95% thru 100 mesh; paper bags (bags extra) 3.50

Marblehead, Ohio — Analysis, 83.54% $CaCO_3$; 14.92% $MgCO_3$; 99.8% thru 100 mesh; sacks 4.25

Piqua, Ohio, sacks, 4.50-5.00; bulk 3.00–3.50

Rocky Point, Va.—85% thru 200 mesh, bulk 2.25–3.50

Waukesha, Wis.—90% thru 100 mesh, bulk 4.50

Glass Sand

Silica sand is quoted washed, dried and screened unless otherwise stated. Prices per ton f.o.b. producing plant.

Cedarville and S. Vineland, N. J. *1.75–2.25
Estill Springs and Sewanee, Tenn. 1.50
Franklin, Penn. 2.00
Klondike, Mo. 2.00
Massillon, Ohio 3.00
Michigan City, Ind. ..... .30– .35
Ohlton, Ohio 2.50
Ottawa, Ill. 1.25
Red Wing, Minn. 1.50
Rockwood, Mich. 2.25–3.00
San Francisco, Calif. 4.00–5.00
Silica and Mendota, Va. 2.00
St. Louis, Mo. 2.00
Utica and Ottawa, Ill. 75–1.00
Zanesville, Ohio 2.50

Miscellaneous Sands

City or shipping point	Roofing sand	Traction
Beach City, Ohio	.....	1.50
Dresden, Ohio	.....	1.25
Eau Claire, Wis.	4.25	.....
Estill Springs and Sewanee, Tenn.	1.35–1.50	1.35–1.50
Franklin, Penn.	.....	1.75
Massillon, Ohio	.....	2.00
Michigan City, Ind.	.....	.30
Montoursville, Penn.	.....	1.25
Ohlton, Ohio	1.75	1.75
Ottawa, Ill.	1.25	1.25
Red Wing, Minn.	.....	1.00
San Francisco, Calif.	3.50	3.50
Silica, Va.	.....	1.75

(Continued on next page)

Wholesale Prices of Sand and Gravel

Prices given are per ton, F.O.B., producing plant or nearest shipping point

Washed Sand and Gravel

City or shipping point	Fine Sand, 1/10 in. down	Sand, ¼ in. and less	Gravel, ½ in. and less	Gravel, 1 in. and less	Gravel, 1½ in. and less	Gravel, 2 in. and less
EASTERN:						
Asbury Park, Farmingdale, Spring Lake and Wayside, N. J.	.....	.55	1.10	1.25	1.40	.....
Attica and Franklinville, N. Y.	.75	.75	.75	.75	.75	.75
Boston, Mass.‡	1.40	1.40	2.25	.....	2.25	2.25
Buffalo, N. Y.	1.10	1.05	1.05	1.05	1.05	1.05
Erie, Penn.	.60	.85	.....	1.25	.....	1.25
Leeds Junction, Me.	.....	.50	1.75	.....	1.25	1.00
Machias Jct., N. Y.	.75	.65	.65	.65	.65	.65
Milton, N. H.	.....	.50	.....	.....	.....	.90
Montoursville, Penn.	1.00	.85	.70	.60	.50	.50
Northern New Jersey	.50– .60	.50– .60	1.25	.....	1.35	1.25
Somerset, Penn.	.....	2.00	.....	.....	.....	.....
South Portland, Me.	.....	1.00	2.50	.....	2.25	.....
Troy, N. Y.	.50– .75*	.50– .75*	.80–1.00*	.80–1.00*	.....	.80–1.00*
F. o. b. boat, per yd.	1.50	1.50	1.75	1.75	.....	1.75
Washington, D. C.	55	.55	1.20	1.20	1.00	1.00
CENTRAL:						
Algonquin, Ill.	.40*	.20*	.20*	.30*	.35*	.40*
Attica, Ind.			All sizes .75–.85			
Aurora, Moronts, Oregon, Sheridan, Yorkville, Ill.	.50	.35	.20	.50	.60	.60
Barton, Wis.	.....	.40	.60	.65	.65	.65
Chicago, Ill.	.50	.50–1.45n	.60	.60–1.55n	.60	.60–1.90n
Chicago, Ill.	.30	.20	.30	.40	.40	.45
Columbus, Ohio	.....	.60	.60	.60	.60	.....
Des Moines, Iowa	.....	.30	.....	1.40	1.50	.....
Eau Claire, Chippewa Falls, Wis.	.40	.40	.55	.85	.85	.....
Elkhart Lake, Wis.	.60	.40	.60	.55	.45	.45
Ferrysburg, Mich.	.....	.50– .80	.60–1.00	.60–1.00	.....	.50–1.25
Grand Haven, Mich.	.....	.60– .80	.70– .90	.70– .90	.....	.70– .90
Grand Rapids, Mich.	.50	.50	.90	.80	.70	.70
Hamilton, Ohio	.....	1.00	1.00	.....	1.00	.....
Hersey, Mich.	.....	.50	.50	.60	.70	.70
Humboldt, Iowa	.35	.35	1.35	1.35	1.35	1.35
Indianapolis, Ind.	.60	.60	.....	.90	.75–1.00	.75–1.00
Mankato, Minn.	.....	.45g	.....	.60–1.25h	.70–1.25	1.25c
Mason City, Iowa	.....	.50	.85	1.25	1.25	1.25
Mattoon, Ill.			.75–.85 all sizes			
Milwaukee, Wis.	.96	.91	1.06	1.06	1.06	1.06
Minneapolis, Minn.	.35p	.35p	1.25q	1.25q	1.25q	1.25q
St. Louis, Mo.	1.15e	1.45f	1.45a	1.45	1.45	1.45
St. Paul, Minn.	.35	.35	.75	1.25	1.25	1.25
Terre Haute, Ind.	.75	.60	.75	.85	.75	.75
Waukesha, Wis.	.....	.45	.60	.60	.65	.65
Winona, Minn.	.40	.40	1.50	1.25	1.10	1.10
SOUTHERN:						
Brewster, Fla.	.50	.50	3.00	3.00	.....	.....
Brookhaven, Miss.	1.25	.70	1.25	1.00	.70	.70
Charleston, W. Va.			River sand and gravel, all sizes, 1.40			
Eustis, Fla.	.....	.45	.....	.....	.....	.....
Fort Worth, Tex.	1.00	.90–1.10	1.25	1.00	1.00	1.00
Knoxville, Tenn.	1.00	1.00	1.20	1.20	1.20	1.20
Macon, Ga.	.65– .90	.65– .90	2.25–2.50	2.25–2.50	2.25–2.50	2.25–2.50
New Martinsville, W. Va.	1.10	1.00	.....	1.30	1.10	.90
Roseland, La.	.35	.15	.85	.85	.75	.75
WESTERN:						
Kansas City, Mo.	.70– .80	.70– .75	.....	.....	.....	.....
Crushton, Durbin, Kincaid, Largo, Rivas, Calif.	.10– .40	.10– .40	.50–1.00	.50–1.00	.50–1.00	.50–1.00
Oregon City, Ore.	1.25*	1.25*	1.25*	1.25*	1.25*	1.25*
Otay, Calif.	.....	.35– .40	.50– .60	.50– .60	.50– .60	.50– .60
Phoenix, Ariz. (k)	1.25*	1.15*	1.50*	1.15*	1.15*	1.00*
Pueblo, Colo.	.70	.60	.....	1.25	.....	1.15
Seattle, Wash.	1.25*	1.25*	1.25*	1.25*	1.25*	1.25*
Steilacoom, Wash.	.50	.50	.50	.50	.50	.50

Bank Run Sand and Gravel

City or shipping point	Fine Sand, 1/10 in. down	Sand, ¼ in. and less	Gravel, ½ in. and less	Gravel, 1 in. and less	Gravel, 1½ in. and less	Gravel, 2 in. and less
Algonquin and Beloit, Wis.	.....	.....	.30	.....	.....	.....
Brookhaven, Miss.	.....	.....	.....	.....	.....	.60
Buffalo, N. Y.	1.10	.95	.....	.85	.....	.85
Burnside, Conn.	.75*	.....	1.30	1.10	1.00	1.00
Chicago, Ill.	1.25m	.....	.....	.35	.....	.....
Des Moines, Iowa	.....	.....	.....	.60	.....	.....
Dresden, Ohio	.....	.....	.....	.70	.65	.....
Eau Claire, Chippewa Falls, Wis.	.....	.....	.....	.....	.65	.....
Fort Worth, Tex.	.....	.....	.....	.....	.....	.50r
Gainesville, Tex.	.....	.....	.....	.....	.55	.....
Grand Rapids, Mich.	.....	.....	.....	.50	.....	.....
Hamilton, Ohio	.....	.....	.....	.....	1.00	.....
Hersey, Mich.	.....	.....	.....	.50	.....	.....
Indianapolis, Ind.			Mixed gravel for concrete work, at .65			
Macon, Ga.	.35	.....	.....	.....	.....	.....
Oregon City, Ore.	1.25*	1.25*	1.25*	1.25*	1.25*	1.25*
Somerset, Penn.	.....	1.85–2.00	.....	1.50–1.75	.....	.....
Steilacoom, Wash.	.25	.....	.....	.....	.....	.....
St. Louis, Mo.			Mine run gravel, 1.55 per ton			
Summit Grove, Ind.	.50	.50	.50	.50	.50	.54
Winona, Minn.	.40	.40	1.50	1.25	1.10	1.10
York, Penn.	1.10	1.00	.....	.....	.....	.....

*Cubic yd. ‡Delivered on job by truck. (a) ⅝-in. down. (b) River run. (c) 2½-in. and less. ¶By truck only. (d) Delivered in Hartford, Conn., $1.50 per yd. (e) Mississippi River. (f) Meramee River. (g) Washed and screened river sand. (h) ¾-in. to ¼-in. (j) Lake sand, 1.75, delivered. (k) 60-70% crushed boulders. (m) Cu. yd., dune sand, f.o.b. cars, Chicago. (n) Cu. yd., f.o.b. cars, Chicago. (p) .65 cu. yd. (q) $1.75 to $2.00 cu. yd. (r) pit run.

Core and Foundry Sands

Silica sand is quoted washed, dried and screened unless otherwise stated. Prices per ton f.o.b. producing plant.

City or shipping point	Molding, fine	Molding, coarse	Molding, brass	Core	Furnace lining	Sand blast	Stone sawing
Albany, N. Y.	2.00	2.00	2.25	.....	.....	4.00	.....
Beach City, Ohio	1.75–2.00	1.75–2.00	.....	1.50	1.75	.....	.....
Dresden, Ohio	1.25–1.50	1.25–1.50	1.50–1.75	1.00–1.25	.....	.....	.....
Eau Claire, Wis.	.....	.....	.....	.....	.....	3.00	.....
Elco and Murphysboro, Ill.	Ground silica per ton in carloads—18.00–31.00						
Estill Springs and Sewanee, Tenn.	1.25	.....	.....	1.25	.....	1.35–1.50	.....
Franklin, Penn.	1.75	1.75	.....	1.75	.....	.....	.....
Kasota, Minn.	.....	.....	.....	.....	.....	.....	1.00
Kerrs, Ohio	1.10–1.50	1.25–2.00	2.00	.....	.....	2.75–3.00	.....
Klondike, Mo.	2.00	.....	.....	2.00	.....	.....	.....
Massillon, Ohio	2.25	2.25	.....	2.25	2.50	.....	.....
Michigan City, Ind.	.....	.....	.....	.30– .35	.....	.....	.....
Montoursville, Penn.	.....	.....	.....	1.35–1.60	.....	.....	.....
New Lexington, Ohio	2.00	1.50	.....	.....	.....	.....	.....
Ohlton, Ohio	2.00	2.00	.....	1.75	1.75	1.75	.....
Ottawa, Ill.	1.25	2.25	2.25	2.25	1.25	3.50	2.00
Red Wing, Minn. (d)	.....	.....	.....	.....	1.50	3.00	1.50
San Francisco, Calif.[1]	3.50†	5.00†	3.50†	3.50–5.00†	3.50–5.00†	3.50–5.00†	.....
Silica, Mendota, Va.	Potters flint, 8.00–10.00g						
Utica and Ottawa, Ill.	.40–1.00f	.40–1.00f	.75–1.00	.40–1.00f	.60–1.00f	2.23–3.25	1.00–3.25
Utica, Ill.	.....	.60	.70	.....	.75	1.00	.....
Warwick, Ohio	1.50*–2.00h	1.50*–2.00h	.....	1.50*–2.00h	.....	.....	.....
Zanesville, Ohio	2.00	1.50	2.00	2.50	2.00	.....	.....

*Green. †Fresh water washed, steam dried. [1]Core, washed and dried, 2.50. (d) Filter sand, 3.00. (e) Filter sand, 3.00–4.25. (f) Crude and dry. (g) Also 7.00; building sand, 1.75–2.00. (h) Washed, 1.75.

Crushed Slag

City or shipping point	Roofing	¼ in. down	½ in. and less	¾ in. and less	1½ in. and less	2½ in. and less	3 in. and larger
EASTERN:							
Buffalo, N. Y., Erie and Dubois, Penn.	2.25	1.25	1.25	1.35	1.25	1.25	1.25
Eastern Penn.	2.50	1.20	1.50	1.20	1.20	1.20	1.20
Northern New Jersey	2.50	1.20	1.50	1.20	1.20	1.20	1.20
Reading, Penn.	2.00	1.00	.....	1.25	.....	.....	.....
Western Pennsylvania	2.50	1.25	1.50	1.25	1.25	1.25	1.25
CENTRAL:							
Ironton, Ohio	.....	1.30*	.....	1.45*	1.45*	1.45*	.....
Jackson, Ohio	2.05*	1.05*	1.80*	1.30*	1.05*	1.30*	1.30*
Toledo, Ohio	1.50	1.35	1.35	1.35	1.35	1.35	1.35
SOUTHERN:							
Ashland, Ky.	2.05*	1.45*	1.80*	1.45*	1.45*	1.45*	1.45*
Ensley and Alabama City, Ala.	2.05	.55	1.25	1.15	.90	.90	.90
Longdale, Roanoke, Ruesens, Va.	2.50	1.00	1.25	1.25	1.25	1.15	1.05
Woodward, Ala.†	.....	.50*	.....	1.15*	.90*	.90*	.....

5c per ton discount on terms. †1¼ in. to ¼ in., $1.05; ⅝ in. to 10 mesh, $1.25*; ⅝ in. to 0 in., .90*; ¼ in. to 10 mesh, .80*.

Lime Products (Carload Prices Per Ton F.O.B. Shipping Point)

	Finishing hydrate	Masons' hydrate	Agricultural hydrate	Chemical hydrate	Ground burnt lime, Blk.	Ground burnt lime, Bags	Lump lime, Blk.	Lump lime, Bbl.
EASTERN:								
Berkeley, R. I.	.....	.....	12.00	.....	.....	.....	.....	2.00
Buffalo, N. Y.	11.50	7.50	7.50	12.00	8.00	11.00	7.50	1.50[16]
Lime Ridge, Penn.	.....	.....	.....	.....	.....	.....	5.00	.....
West Stockbridge, Mass.	12.00	10.00	5.60	.....	.....	.....	.....	2.00[12]
Williamsport, Penn.	10.00–11.00	8.50–9.00	8.50–9.00	.....	7.00	9.00	5.00	.....
York, Penn., & Oranda, Va.	11.50[7]	8.50–9.50[7]	8.50–9.50[7]	8.50–10.50[7]	8.00	9.25	7.00	1.40[5]
CENTRAL:								
Afton, Mich.	.....	.....	.....	.....	.....	10.00	7.50	.....
Carey, Ohio	11.50	7.50	7.50	.....	8.00	.....	8.00	.....
Cold Springs, Ohio	.....	8.00	7.50	.....	.....	.....	8.00	.....
Gibsonburg, Ohio	11.50	7.50	7.50	.....	8.00	10.00	.....	.....
Huntington, Ind.	11.50	7.50	7.50	12.00	8.00	11.00	7.50	1.50[16]
Luckey, Ohio	11.50	.....	.....	.....	.....	.....	.....	.....
Milltown, Ind.	.....	8.50–10.00	.....	10.00[8]	.....	.....	8.50[22]	1.35[10]
Ohio points	11.50	7.50	7.50	12.00	8.00	11.00	7.50	1.50[16]
Scioto, Ohio	11.50	7.50	7.50	8.50	8.25	.62½	7.00	1.50
Sheboygan, Wis.	.....	10.50	.....	.....	.....	.....	9.50	2.00[4]
Wisconsin points[6]	.....	11.50	.....	.....	.....	.....	9.50	.....
Woodville, Ohio	11.50	7.50	7.50	12.50	8.00	10.00[9]	8.00	1.50[8]
SOUTHERN:								
El Paso, Texas	.....	.....	.....	.....	.....	.....	7.00	1.50
Frederick, Md.	.....	8.00–9.50	8.00–9.50	.....	.....	9.50[15]	7.00[15]	.....
Graystone & Landmark, Ala.	12.50	9.00	.....	12.50	.....	.....	7.00	1.35
Keystone, Ala.	12.50	9.00	9.00	10.00	.....	.....	8.00	1.35
Knoxville, Tenn.	19.00	9.00	9.00	9.00	.....	.....	7.50	1.35
Ocala, Fla.	14.00	11.00	11.00	14.00	.....	.....	.....	.65[10]
WESTERN:								
Kirtland, N. M.	.....	.....	.....	.....	.....	.....	15.00	.....
Los Angeles, Calif.	15.00	14.00	12.00	18.00	.....	.....	13.50	.....
San Francisco, Calif.	19.00–19.50	16.00–17.50	12.50–13.70	19.00	13.00[19]	.90[17]	13.00[19]	1.85[17]
Tehachapi, Calif.[13]	10.80	.....	6.75[11]	12.00	.....	.....	10.30	.....
Seattle, Wash.	19.00	19.00	12.00	19.00	19.00	.....	18.60	2.30

[1] Barrels. [2] Net ton. [3] Wooden, steel 1.70. [4] Steel; in bbl. .95. [5] Dealers' prices, net 30 days less 25c discount per ton on hydrated lime and 5c per bbl. on lump if paid in 10 days. [7] In paper bags, including bags. [8] To 11.00. [9] 80-lb. [10] To 1.50. [11] Refuse or air slack, 10.00–12.00. [12] To 3.00. [13] Delivered in Southern California. [15] To 8.00. [16] to 1.70. [17] Less credit for return of empties. [18] 90-lb. sacks. [19] Also 14.50. [22] To 9.00. [50] To 16.50.

Miscellaneous Sands

(Continued)

City or shipping point	Roofing sand	Traction
Utica and Ottawa, Ill.	1.00–3.25	.75
Warwick, Ohio	.....	2.00
Zanesville, Ohio	.....	2.50

*Damp.

Talc

Prices given are per ton f.o.b. (in carload lots only), producing plant, or nearest shipping point.

Chatsworth, Ga.:
- Crude talc (for grinding) 4.00–50.00
- Ground talc (20-50 mesh), bags 8.00
- Ground talc (150-200 mesh), bags 8.50–15.50
- Pencils and steel crayons, gross 1.00– 2.00

Chester, Vt.:
- Ground talc (150-200 mesh), paper bags 7.50–8.50a
- Same, including 50-lb. bags 8.50– 9.50

Chicago and Joliet, Ill.:
- Ground (150-200 mesh), bags 30.00

Cromleys Mt., Md.:
- Crude talc 63.00

Dalton, Ga.:
- Crude talc (for grinding) 4.00
- Ground talc (150-200 mesh), bags 9.00
- Pencils and steel worker's crayons, per gross 1.00– 2.00

Emeryville, N. Y.:
(Double air floated) including bags:
- 325 mesh 14.75
- 200 mesh 13.75

Hailesboro, N. Y.:
- Ground white talc (double and triple air floated) 200-lb. bags, 300-350-mesh 15.50–20.00

Henry, Va.:
- Crude (mine run) 3.50– 4.50
- Ground talc (150-200 mesh), bags 8.75–14.00

Joliet, Ill.:
- Ground talc (150-200 mesh) in bags:
- California white 30.00
- Southern white 20.00
- Illinois talc 10.00

Keeler, Calif.:
- Ground (200-300 mesh), bags 20.00–30.00

Natural Bridge, N. Y.:
- Ground talc (300-325 mesh), bags 12.00–15.00

(a) Bags extra.

Rock Phosphate

Prices given are per ton (2240-lb.) f.o.b. producing plant or nearest shipping point.

Lump Rock

- Columbia, Tenn.—B.P.L. 65-70% 3.50– 4.50
- Gordonsburg, Tenn.—B.P.L. 65-70% 4.25– 4.75
- Mt. Pleasant, Tenn.—B.P.L. 78% 6.50– 6.75
- Tennessee — F.o.b. mines, gross ton, unground brown rock, B.P.L. 72% 5.00
- B.P.L. 75% 6.00
- Twomey, Tenn.—B.P.L. 65%, 2000 lb. 8.00– 9.00

Ground Rock
(2000 lb.)

- Centerville, Tenn.—B.P.L. 65% 8.00
- Gordonsburg, Tenn.—B.P.L. 65% 6.00
- B.P.L. 72% 8.00
- Mt. Pleasant, Tenn.—Lime phosphate: B.P.L. 73% to 75%, 98% thru 100 mesh, bags extra 11.70
- 80-85% thru 300 mesh, bags extra 11.80
- Twomey, Tenn.—B.P.L. 65% 8.00
- Wales, Tenn.—B.P.L. 65% 11.00

Florida Phosphate

(Raw Land Pebble)
(Per Ton)

- Florida—F.o.b. mines, gross ton, 68/66% B.P.L., Basis 68% 3.25
- 70% min. B.P.L., Basis 70% 3.75

Mica

Prices given are net, f.o.b. plant or nearest shipping point.

- New York City, N. Y.—Per lb., Cut mica (1½x2) 1.60
- Cut mica (8x10) 26.00
- Pringle, S. D.—Mine run, per ton 125.00
- Punch mica, per lb. .06
- Scrap, per ton, carloads 20.00
- Rumney Depot, N. H.—Per ton, Mine run 300.00
- Clean shop scrap 25.00
- Mine scrap 22.50–24.00
- Roofing mica 37.50
- Punch mica, per lb. .12
- Cut mica—50% iron Standard List.

Special Aggregates

Prices are per ton f.o.b. quarry or nearest shipping point.

City or shipping point	Terrazzo	Stucco-chips
Brandon, Vt.—English pink, English cream and coral pink	¶12.50–‖14.50	¶12.50–‖14.50
Brighton, Tenn.—Pink marble chips	$3.00	$3.00
Crown Point, N. Y.—Mica spar		9.00–10.00
Davenport, Ia.—White limestone, in bags	6.00	6.00
Easton, Penn.		8.00– 9.00
Harrisonburg, Va. — Bulk marble (crushed, in bags)	†12.50	†12.50
Ingomar, Ohio — Concrete facings and stucco dash		11.00–18.00
Middlebrook, Mo.—Red		20.00–25.00
Middlebury, Vt. — Middlebury white	¶9.00–‖10.00	¶9.00–‖10.00
Middlebury and Brandon, Vt.—Caststone, per ton, including bags		4.00– 5.50
Phillipsburg, N. J.—Royal green granite		15.00–18.00
Randville, Mich.—Crystalite white marble, bulk	4.00	4.00– 7.00
Rose pink granite, bulk		12.00
Stockton, Calif.—"Nat-rock" roofing grits		12.00–20.00
Tuckahoe, N. Y.—Tuckahoe white	8.00	
Warren, N. H.		¶7.90–‖8.95
Wauwatosa, Wis.		20.00–32.00
Wellsville, Colo.—Colorado Travertine Stone	15.00	15.00
Whitestone, Ga.		*10.00

†C.L.; L.C.L. 16.00. ¶C.L. ‖L.C.L. (a) Including bags. *Per 100 lb.

Potash Feldspar

Auburn and Topsham, Me.—Color white, 98% thru 140-mesh	19.00
Buckingham, Ore. — White, analysis, K_2O, 12-13%; Na_2O, 1.75%; bulk	9.00
De Kalb Jct., N. Y. — Color, white; analysis, K_2O, 9.63%; Na_2O, 1.01%; SiO_2, 69.72%; Fe_2O_3, .00%; Al_2O_3, 18.6%; bulk (crude)	9.00
East Hartford, Conn. — Color, white, 40 mesh to 200 mesh	15.00–28.00
East Liverpool, Ohio — Color, white; 98% thru 200 mesh, bulk	19.35
Soda feldspar, crude, bulk, per ton	22.00
Glen Tay Station, Ont.—Color, red or pink; analysis, K_2O, 12.81%; crude	7.00
Keystone, S. D.—White; bulk (crude)	8.00
Los Angeles, Calif.—Color, white; analysis, K_2O, 12.16%; Na_2O, 1.53%; SiO_2, 65.60%; Fe_2O_3, .10%; Al_2O_3, 19.20%; Arizona spar, crude, bags, 12.50–14.00; bulk	11.00–12.50
Pulverized, 95% thru 200 mesh; bags, 19.73–23.50; bulk	15.75–22.50
Pulverized, 20% thru 80 mesh; bags, 17.60; bulk	16.50
Murphysboro, Ill.—Color, prime white; analysis, K_2O, 12.60%; Na_2O, 2.35%; SiO_2, 63%; Fe_2O_3, .06%; Al_2O_3, 18.20%; 98% thru 200 mesh; bags, 21.00; bulk	20.00
Penland, N. C.—White; crude, bulk	8.00
Ground, bulk	16.50
Spruce Pine, N. C.—Color, white; analysis, K_2O, 10%; Na_2O, 3%; SiO_2, 68%; Fe_2O_3, 0.10%; Al_2O_3, 18%; 99½ thru 200 mesh; bulk (Bags 15c extra.)	18.00
Crude feldspar, bulk	10.00
Tennessee Mills—Color, white; analysis, K_2O, 10%; Na_2O_3, 3%; SiO_2, 68%; 99½% thru 200 mesh; bulk (Bags, 15c extra)	18.00
Toronto, Can.—Colo, flesh; analysis K_2O, 12.75%; Na_2O, 1.96%; crude	7.50– 8.00

Chicken Grits

Afton, Mich.—(Limestone), per ton	1.75
Belfast, Me.—(Limestone), per ton	‡10.00
Chico and Bridgeport, Tex.	12.00
Danbury, Conn.; Adams, Ashley Falls, and West Stockbridge, Mass.—(Limestone)	‡7.50–*9.00
Davenport, Ia.—(Limestone), bags, per ton	6.00
Easton, Penn.—In bags	8.00
El Paso, Tex.—Per ton	1.00
Knoxville, Tenn.—Per bag	1.25
Los Angeles, Calif.—Per ton, including sacks:	
Feldspar	14.00
Gypsum	7.50
Marion, Va.—(Limestone), bulk, 5.00; bagged, 6.50; 100-lb. bag	.50
Middlebury, Vt.—Per ton	10.00
Randville, Mich.—(Marble), bulk	6.00
Rocky Point, Va.—(Limestone), 100-lb. bags, 50c; sacks, per ton, 6.00; bulk	5.00
Seattle, Wash.—(Gypsum), bulk, per ton	10.00
Tuckahoe, N. Y.	8.00
Waukesha, Wis.—(Limestone), per ton	8.00
Wisconsin Points—(Limestone), per ton	15.00
Winona, Minn.—(Limestone), sacked, per ton, 8.00; bulk, per ton	6.00

*L.C.L. †Less than 5-ton lots. ‡C.L. ¶100-lb. bags.

Sand-Lime Brick

Prices given per 1000 brick f.o.b. plant or nearest shipping point, unless otherwise noted.

Albany, Ga.	10.00
Anaheim, Calif.	10.50–11.00
Barton, Wis.	10.50g
Boston, Mass.	17.00*
Brighton, N. Y.	19.75*
Brownstone, Penn.	11.00
Dayton, Ohio	12.50–13.50
Detroit, Mich.	13.00–16.00*d
Farmington, Conn.	13.00
Flint, Mich.	18.00†
Grand Rapids, Mich.	12.50
Hartford, Conn.	14.00–19.00*
Jackson, Mich.	13.00
Lakeland, Fla.	10.00–11.00
Lake Helen, Fla.	9.00–12.00
Lancaster, N. Y.	12.25
Madison, Wis.	12.50a
Mishawaka, Ind.	11.00
Milwaukee, Wis.	13.00*
Minneapolis, Minn.	10.00
New Brighton, Minn.	10.00
Pontiac, Mich.	12.50–15.00*
Pontiac, Mich.	11.50
Portage, Wis.	15.00
Prairie du Chien, Wis.	18.00–22.50
Rochester, N. Y.	19.75
Saginaw, Mich.	13.50
San Antonio, Texas	12.50–14.00
Sebewaing, Mich.	12.50
Sioux Falls, S. Dak.	13.00
South River, N. J.	13.00
Syracuse, N. Y.	18.00–20.00
Toronto, Canada (f)	15.00†e
Wilkinson, Fla.	12.00–16.00
Winnipeg, Canada	15.00

*Delivered on job. †5% disc. 10 days. ‖Dealers' price. (a) Less 50c disc. per M, 10th of month. (d) 5% disc., 10th of month. (e) Delivered in city limits. (f) F.o.b. yard, 12.50. (g) Delivered Milwaukee, 13.00.

Portland Cement

Prices per bag and per bbl., without bags, net, in carload lots.

	Per Bag	Per Bbl.
Albuquerque, N. M.		3.70
Atlanta, Ga.		2.36
Baltimore, Md.		2.25–2.65
Birmingham, Ala.		2.00
Boston, Mass.	.47	2.33–2.73
Buffalo, N. Y.	.52½	2.10–2.50
Butte, Mont.	.90¼	3.61
Cedar Rapids, Iowa		2.24
Charleston, S. C.		1.85
Cheyenne, Wyo.	.64	2.56
Chicago, Ill.		2.05–2.45
Cincinnati, Ohio		2.22–2.62
Cleveland, Ohio		2.24–2.64
Columbus, Ohio		2.22–2.62
Dallas, Texas		1.80
Davenport, Iowa		2.24
Dayton, Ohio		2.24–2.64
Denver, Colo.	.63¾	2.55
Des Moines, Iowa		2.05
Detroit, Mich.		1.95
Duluth, Minn.		2.04
Houston, Texas		1.90
Indianapolis, Ind.	.54¾	2.19–2.59
Jackson, Miss.		2.04–2.44
Jacksonville, Fla.		2.60b
Jersey City, N. J.		2.13–2.53
Kansas City, Mo.	.45½	1.82
Los Angeles, Calif.	.62½	2.50
Louisville, Ky.	.55½	2.57
Memphis, Tenn.		2.04–2.44
Milwaukee, Wis.		2.20–2.60
Minneapolis, Minn.		2.12–2.22
Montreal, Que.		1.60
New Orleans, La.	.45½	1.82
New York, N. Y.	.50¾	2.03–2.43
Norfolk, Va.		2.07
Oklahoma City, Okla.	.57¼	2.29
Omaha, Neb.	.54	2.16
Peoria, Ill.		2.22
Philadelphia, Penn.		2.21–2.61
Phoenix, Ariz.		3.91*
Pittsburgh, Penn.		2.04
Portland, Colo.		2.80
Portland, Ore.‡		2.40–2.90a
Reno, Nev.‡		3.41a
Richmond, Va.		2.40–2.80
Salt Lake City, Utah	.70¼	2.81
San Francisco, Calif.‡		2.71a
Savannah, Ga.		2.60c
St. Louis, Mo.	.48¾	1.95–2.35
St. Paul, Minn.		2.12–2.22
Seattle, Wash.		2.90†
Tampa, Fla.		2.40
Toledo, Ohio		2.20–2.60
Topeka, Kana.	.50¼	2.01
Tulsa, Okla.	.53¾	2.13
Wheeling, W. Va.		2.12–2.52
Winston-Salem, N. C.		2.29
Mill prices f.o.b. in carload lots, without bags, to contractors.		
Albany, N. Y.	.43¾	1.75
Bellingham, Wash.		2.10
Buffington, Ind.		1.80
Chattanooga, Tenn.		2.45*
Concrete, Wash.		2.55
Davenport, Calif.		2.05
Hannibal, Mo.		1.90
Hudson, N. Y.		1.75
Leeds, Ala.		1.65
Lime and Oswego, Ore.		2.50‡
Mildred, Kan.		2.35
Nazareth, Penn.		2.15
Northampton, Penn.		1.75
Richard City, Tenn.		2.05
Steelton, Minn.		1.85
Toledo, Ohio		2.20
Universal, Penn.		1.80

NOTE—Add 40c per bbl. for bags. *Includes sacks. †10c disc., 10 days. ‡10c disc., 15 days. (a) Includes cloth sacks returnable at 10c each. (b) 24c bbl. refund for paid freight bill. (c) 35c bbl. refund for paid freight bill.

Gypsum Products— CARLOAD PRICES PER TON AND PER M SQUARE FEET, F.O.B. MILL

	Crushed Rock	Ground Gypsum	Agricultural Gypsum	Stucco Calcined Gypsum	Cement and Gaging Plaster	Wood Fiber	Gaging White	Plaster Sanded	Cement Keene's	Finish Trowel	—Plaster Board— ¼x32x 36". Per M Sq. Ft.	⅜x32x 36". Per M Sq. Ft.	Wallboard, ⅜x32 or 48" Lengths 6'-10'. Per M Sq. Ft.
Acme, Tex.	1.70	4.00	4.00	4.00	4.00	4.50	.....	.....	.....	.....	.....	15.00	20.00
Arden, Nev., and Los Angeles, Calif.	3.00	8.00u	8.00u	10.70u	10.70u	.....	.....	.....	.....	11.70u	.....	.....	.....
Blue Rapids, Kan.	1.70	4.00	.....	.....	.....	.....	10.00	.....	.....	.....	.....	15.00	20.00
Centerville, Iowa	3.00	10.00	15.00	10.00	10.00	10.50	13.50	.....	.....	13.50	.....	.....	.....
Des Moines, Iowa	3.00	8.00	9.00	10.00	10.00	10.50	13.50	12.00	24.00	22.00	18.00	21.00	30.00
Detroit, Mich.	.....	.....	.....	.....	14.30o	12.30m	.....	m9.00–11.00o	.....	.....	.....	.....	.....
Delawanna, N. J.	.....	.....	.....	4.50–5.00	13.10–14.00	5.00	.....	7.25	.....	.....	.....	.....	25.00
Douglas, Ariz.	.....	.....	6.00	14.50	15.00	.....	18.00	.....	30.00	.....	.....	.....	.....
Fort Dodge, Iowa	1.70	4.00	6.00	9.00	9.00	9.50	.....	.....	.....	19.00	.....	15.00	20.00
Grand Rapids, Mich.	2.65	4.00	6.00	6.00	9.00	9.00	17.65	.....	22.75	19.00	12.00	15.00	18.00
Gypsum, Ohio	1.70–3.00	4.00	6.00	7.00–9.00	9.00	9.00	19.00	7.00	24.50	19.00	.....	15.00	20.00–25.00
Los Angeles, Calif.	4.90	7.50m	7.50m	8.40	9.00	.....	10.00	.....	36.00u	9.00	19.00	21.00	27.50
Medicine Lodge, Kan.	1.70	4.00	.....	.....	.....	.....	.....	.....	15.00	.....	.....	15.00	20.00
Oakfield, N. Y.	2.50	.....	.....	5.50	6.00	6.00	.....	5.50	.....	.....	.....	15.00	25.00
Port Clinton, Ohio	3.00	4.00	6.00	10.00	9.00	9.00	21.00	7.00	30.15	20.00	.....	20.00	30.00
Portland, Colo.	.....	.....	.....	10.00	.....	.....	.....	.....	.....	.....	.....	.....	.....
San Francisco, Calif.	.....	.....	9.00	13.40	14.40	.....	15.40	.....	.....	.....	.....	.....	.....
Seattle, Wash. (b)	6.10	10.50	10.50	12.00	13.00	.....	.....	.....	.....	.....	.....	15.00c	22.50
Winnipeg, Man.	5.00	5.00	7.00	13.00	14.00	14.00	.....	.....	.....	.....	20.00	25.00	33.00

NOTE—Returnable bags, 10c each; paper bags, 1.00 per ton extra (not returnable). (a) Hardwall plaster, 13.00; casting, finishing molding, 14.00; (b) Calacoustic plaster, 10.00 at mill; (c) Plaster lath; (m) includes paper bags; (o) includes jute sacks; (u) includes sacks; (v) retail 35.00

Market Prices of Cement Products and Slate

Concrete Block

Prices given are net per unit, f.o.b. plant or nearest shipping point

City or shipping point	Sizes 8x8x16	8x10x16	8x12x16
Camden, N. J.	17.00	.....	.....
Cement City, Mich.	.....	5x8x12–55.00¶	.....
Chicago District‖	180.00–210.00a	230.00–260.00a	280.00–330.00a
Columbus, Ohio	16.00	.....	.....
Detroit, Mich.	.15– .17†	.....	.24–.26†
Forest Park, Ill.	21.00*	.....	.....
Grand Rapids, Mich.	15.00*	.....	.....
Graettinger, Iowa	.18– .20	.....	.....
Indianapolis, Ind.	.10– .12a	.....	.....
Los Angeles, Calif.	4x8x12–5.00*	.....	.....
Olivia and Mankato, Minn.	9.50b	.....	.....
Somerset, Penn.	.18– .20	.....	.....
Tiskilwa, Ill.	.16– .18†	.....	.....
Yakima, Wash.	20.00*	.....	.....

*Price per 100 at plant. †Rock or panel face. (a) Face. ‡Delivered. ¶Price per 1000. (b) Per ton. (c) Plain.

Concrete Brick

Prices given per 1000 brick, f.o.b. plant or nearest shipping point.

	Common	Face
Appleton, Minn.	22.00	25.00– 40.00
Baltimore, Md. (Del. according to quantity)	15.50	22.00– 50.00
Camden & Trenton, N. J.	17.00	.....
Chicago District	14.00	.....
Columbus, Ohio	16.00	17.00
El Paso, Tex.—Klinker	10.00	.....
Ensley, Ala. ("Slagtex")	9.00–12.00	.....
Eugene, Ore.	25.00	35.00– 75.00
Forest Park, Ill.	.....	37.00
Friesland, Wis.	22.00	32.00
Longview, Wash.*	15.00	22.50– 65.00
Los Angeles, Calif.	12.50	.....
Milwaukee, Wis.	14.00	30.00
Mt. Pleasant, N. Y.	.....	14.00– 23.00
Omaha, Neb.	18.00	30.00– 40.00
Pasadena, Calif.	10.00	.....
Philadelphia, Penn.	14.75	.....
Portland, Ore.	17.50	23.00– 55.00
Mantel brick—100.00–150.00		
Prairie du Chien, Wis.	14.00	22.50– 25.00
Rapid City, S. D.	18.00	30.00– 35.00
Waco, Texas	16.50	32.50–125.00
Watertown, N. Y.	20.00	35.00
Westmoreland Wharves, Penn.	14.75	20.00
Winnipeg, Man.	14.00	22.00
Yakima, Wash.	22.50	.....

*40% off List.

Cement Roofing Tile

Prices are net per square, carload lots, f.o.b. nearest shipping point, unless otherwise stated.

Camden and Trenton, N. J.—8x12, per sq.:	
Red	15.00
Green	18.00
Chicago, Ill.—Per sq.	20.00
Detroit, Mich.—5x8x12, per M	67.50
Houston, Texas—Roofing Tile, per sq.	25.00
Indianapolis, Ind.—9x15-in.	Per sq.
Gray	10.00
Red	11.00
Green	13.00
Waco, Texas:	Per sq.
4x4	.60
Pasadena, Calif. (Stone Tile):	
3½x4x12, per 100	3.00
3½x6x12, per 100	4.00
3½x8x12, per 100	5.50
Tiskilwa, Ill.;	
8x8, per 100	15.00
Wildasin Spur, Los Angeles, Calif. (Stone-Tile):	
3½x6x12, per M	50.00
3½x8x12, per M	60.00
Prairie du Chien, Wis.:	
5x8x12, per M	82.00
5x4x12, per M	46.00
5x8x6 (half-tile), per M	41.00
5x8x10 (fractional), per M	82.00
Yakima, Wash. (Building Tile):	Each
5x8x12	.10

Wholesale Prices of Slate

Prices given are f.o.b. at producing point or nearest shipping point

Slate Flour

Pen Argyl, Penn.—Screened 200 mesh, $7.50 per ton in paper bags.

Slate Granules

Esmont, Va.—Blue, $7.50 per ton.
Granville, N. Y.—Red, green and black, $7.50 per ton.
Pen Argyl, Penn.—Blue grey, $7.50 per ton.

Roofing Slate

Prices per square—Standard thickness.

City or shipping point:	3/16-in.	¼-in.	⅜-in.	½-in.	¾-in.	1-in.
Arvonia, Va.—Oxford gray Buckingham	14.62	18.13	23.40	26.33	32.14	40.95
Bangor, Penn.—No. 1 clear	13.00	22.00	26.00	30.00	40.00	50.00
No. 1 ribbon	9.25	18.00	22.00	26.00	36.00	46.00
Medium clear	9.50	.....	.....	.....	.....	.....
No. 2 ribbon	6.50	.....	.....	.....	.....	.....
Chapman Quarries, Penn.—Hard vein	11.25	22.00	26.00	30.00	40.00	50.00
Hard vein medium	9.00	18.00	22.00	26.00	36.00	46.00
Fairhaven, Vt.—						
Mottled purple and unfading green	21.00	24.00	30.00	36.00	48.00	60.00
Granville, N. Y.—Sea green, weathering	14.00	24.00	30.00	36.00	48.00	60.00
Semi-weathering, green and gray	15.40	24.00	30.00	36.00	48.00	60.00
Mottled purple and unfading green	21.00	24.00	30.00	36.00	48.00	60.00
Red	27.50	33.50	40.00	47.50	62.50	77.50
Monson, Maine	19.80	24.00	.....	.....	.....	.....
Pen Argyl, Penn.—Albion	10.50	22.00	26.00	30.00	40.00	50.00
Albion mediums	9.00	18.00	22.00	26.00	36.00	46.00
Cathedral gray	12.50	22.00	26.00	30.00	40.00	50.00
No. 1 ribbon	8.50	18.00	22.00	26.00	36.00	46.00
Textural	15.00	24.00	30.00	36.00	48.00	60.00
Slatedale and Slatington, Penn.—						
Genuine Franklin	11.25	22.00	26.00	30.00	40.00	50.00
Blue Mountain No. 1	10.50	22.00	26.00	30.00	40.00	50.00
Blue Mountain No. 1 clear	9.50	18.00	22.00	26.00	36.00	46.00
Blue Mountain No. 2 clear	8.00	18.00	22.00	26.00	36.00	46.00

(a) Prices are for standard preferred sizes (standard 3/16-in. slates), smaller sizes sell for lower prices.
(b) Prices other than 3/16-in. thickness include nail holes.
(c) Prices for punching nail holes, in standard thickness slates, vary from 50c to $1.25 per square.

Cement Building Tile

Cement City, Mich.:	
5x8x12, per 100	5.00
Chicago District (Haydite):	
4x 8x16, per M	130.00
8x 8x16, per M	220.00
8x12x16, per M	275.00
Columbus, Ohio:	
5x8x12, per 100	6.50
Detroit, Mich.:	
5½x8x12, per M	75.00
Grand Rapids, Mich.:	
5x8x12, per 100	8.00
Longview, Wash.:	
4x6x12, per 100	5.00
4x8x12, per 100	6.25
Mt. Pleasant, N. Y.:	
5x8x12, per M	78.00
Houston, Texas:	
5x8x12 (Lightweight), per M	80.00

Cement Drain Tile

Graettinger, Iowa.—Drain tile, per foot: 5-in., .04½; 6-in., .05½; 8-in., .09; 10-in., .12½; 12-in., .17½; 15-in., .35; 18-in., .50; 20-in., .60; 24-in., 1.00; 30-in., 1.35; 36-in.	2.00
Longview, Wash.—Drain tile, per foot: 3-in., .05; 4-in., .06; 6-in., .10; 8-in., .15; 10-in.	.20
Olivia and Mankato, Minn.—Cement drain tile, per ton	8.00
Tacoma, Wash.—Drain tile, per 100:	
3-in.	4.00
4-in.	5.00
6-in.	7.50
8-in.	10.00
Waukesha, Wis.—Drain tile, per ton	8.00

Current Prices Cement Pipe

Prices are net per foot f.o.b. cities or nearest shipping point in carload lots unless otherwise noted

Culvert and Sewer	4 in.	6 in.	8-in.	10 in.	12 in.	15-in.	18 in.	20 in.	22 in.	24 in.	27 in.	30 in.	36 in.	42 in.	48 in.	54 in.	60 in.
Detroit, Mich.								15.00 per ton									
Detroit, Mich. (c)																	
Sewer	.10	.12	.22	.30	.40	.60	.90	1.20	.....	1.75	2.00	2.50	3.30	4.50	5.75	6.50	8.00
Culvert	.....	.....	.....	.....	.95	1.25	1.60	.....	.....	2.25	2.50	3.00	3.50	5.00	6.50	8.00	10.00
Grand Rapids, Mich.	4 in. to 12 in., 72% off standard sewer price list; 15 in., 65% off; 18 in. to 24 in., 62% off; 27 in. to 36 in., 60% off																
Houston, Texas	.....	.19	.28	.43	.55½	.90	1.30	.....	1.70†	2.20	.....	.....	.....	.....	.....	.....	.....
Indianapolis, Ind. (a)	.....	.....	.....	.75	.85	.90	1.15	.....	.....	1.60	.....	2.50	.....	.....	.....	.....	.....
Longview, Wash.	Sewer pipe 40% off list; culvert—list																
Mankato, Minn. (b)	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.50	1.75	2.50	3.25	4.25	.....	.....	.....
Newark, N. J.	6 in. to 24 in., 18.00 per ton																
Norfolk, Neb. (b)	.....	.....	.....	.90	1.00	1.13	1.42	.....	.....	2.11	.....	2.75	3.58	.....	6.14	.....	7.78
Olivia, Mankato, Minn.	12.00 per ton																
Paullina, Iowa‡	.....	.....	.....	.....	.....	.....	.....	2.25	.....	2.11	.....	2.75	3.58	.....	6.14	.....	7.78
Somerset, Penn.	.....	.....	.....	.....	1.08	1.25	1.65	.....	.....	2.50	.....	3.65	4.85	7.50	8.50	.....	.....
Tiskilwa, Ill. (rein.)	.....	.....	.....	.75	.85	.95	.70	1.55	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tacoma, Wash.	.15	.18	.22½	.30	.40	.60	.85	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wahoo, Neb. (b)	.....	.....	.....	.....	.95	.....	1.27	.....	.....	2.01	.....	2.73	3.78	4.58	6.24	7.19	8.11
Yakima, Wash.	.....	.....	.....	.....	.....	.....	1.42	.....	.....	2.11	.....	2.75	3.58	4.62	6.14	6.96	7.78

(a) 24-in. lengths. (b) Reinforced. (c) Delivered on job; 5% discount, 10th of month. †21-in. diameter. ‡Price per 2-ft. length.

Charles H. MacNider

CHARLES H. MacNIDER, Mason City, Iowa, banker and father of Hanford MacNider, former assistant secretary of war, died October 30 of angina pectoris. Mr. MacNider also was a director of the Federal Reserve Bank of Chicago.

He was alone in his office, talking over the telephone to Dr. W. C. Egloff, when he was stricken. Dr. Egloff said Mr. MacNider suddenly ceased speaking and that he heard a thud. The body was found soon afterward.

Hanford MacNider left Chicago for Mason City by airplane when informed of his father's death.

Mr. MacNider was president of the Northwestern States Portland Cement Co. and a director of the Alpha Portland Cement Co. in addition to being a director in a number of other concerns and president of the First National Bank of Mason City. A widow survives.

Russian Soviet Officials Here to Study Building Materials Industries

HEADING a commission of nine Soviet executives and engineers, S. S. Lobov, vice-president of the Supreme Council of National Economy of the Union of Soviet Socialist Republics, has arrived in this country to study all phases of the American building industry, according to the Amtorg Trading Corp. The commission will devote particular attention to industrial construction and will arrange for designs of industrial plants.

"With a building construction program in force involving the expenditure of hundreds of millions of dollars," said Mr. Lobov, "we are naturally interested in acquainting ourselves first-hand with the latest developments in the field in the United States. During the past fiscal year more than $650,000,000 was invested in capital construction in state industries and $250,000,000 in urban housing construction. Building for electrification and transportation purposes and for public utilities will also involve very large capital outlays.

"We shall be especially interested in studying the building materials industries of this country, with the view of introducing American equipment and methods in the Soviet industries. While our building materials industries are making rapid progress and have surpassed pre-war records, the equipment is far from modern. This results in high costs of building materials and, in consequence, of building construction. With the abundance of raw materials of all kinds for building purposes which our country possesses, and with the aid of foreign equipment and technique, we have no doubt of our being able to carry out our plans."—*New York Times* (New York City).

Rufus T. Gent

RUFUS T. GENT, for nine years general superintendent of the New York Trap Rock Corp., died of pneumonia in Newburgh, N. Y., on October 4.

Mr. Gent was born in Rockford, Ill., on April 6, 1879, where he was educated in the public schools. At an early age he became interested in electrical engineering and when he was 17 years old he began work with the Lewistown and Youngstown Railway at Niagara Falls, N. Y. In 1899 he joined the Westinghouse Co. at Pittsburgh, where he eagerly studied the Westinghouse Engineering course. In 1904 he went with the United Engineering Co. as plant engineer in the construction of the Pennsylvania Railroad tunnels at New York City, the New York State barge canal in 1906, power plants in Cuba and South America in 1908, and the Mount Royal tunnel at Montreal in 1910. In 1914 he became engineer for the Hydro-Electric Power Commission of Canada on the Chippewa power project. In 1919, after completing this work, he accepted the position of general superintendent of the New York Trap Rock Corp., which at that time was a comparatively small company, producing but 600,000 tons of crushed stone annually. During the ensuing years this production was augmented by the construction and purchase of new plants until the output at the time of his death was 5,000,000 tons annually. Mr. Gent's duties of necessity grew accordingly, but were capably and thoroughly discharged by him. His administration was characterized by a spirit of fairness, sound judgment and superb diplomacy and he was well loved by all with whom he came in contact for his keene sense of humor, his unostentatious manner and his habitual use of apt anecdotes to lighten the problem in hand.

Rufus T. Gent

He was a member of the American Society of Mechanical Engineers, the Canadian Society of Electrical Engineers, the Newburgh City Club, the Newburgh Yacht Club and the Powelton Country Club.

B. C. Forbes Comments on Cement Imports

B. C. FORBES, whose newspaper articles on business are syndicated to many big city dailies has commented on the cement import situation under date of October 22, as follows:

"Prior to 1922 the United States had never used as much as 100,000,000 bbl. of portland cement in a single year. Shipments have increased to about 170,000,000 in 1927.

"But in 1922 the producing capacity was about 130,000,000 bbl. The capacity now is about 230,000,000 bbl. Thus producing capacity has grown much more rapidly than demand.

"A large demand doubtless will continue, but the present capacity is considerably greater than the country needs, which means enforced curtailment by some or all cement plants.

"For many years the tariff on imports was 8 cents per 100 lb., but since 1913 cement has been on the free list. Foreign cement makers with low wages and low ocean freights can and do undersell domestic producers at nearly all ocean ports."

Projected Feldspar Development In Minnesota

PLANS are under way to erect a $75,000 mill or crusher and install other improvements in the Northwest Angle, near Warroad, Minn., where feldspar mining has been progressing for the past year. The diamond drill used in the mining operations has been shut down for the time being, as the work of exploring the field has been completed, at least for the present.

The holes were sunk into the rock from 60 to 100 ft., and nowhere did they penetrate through the feldspar rock. Hence the depth of the feldspar is considered satisfactory. The width of the ledge is from 300 to 400 ft. and the length has not been determined. It runs in the same general direction as the feldspar and mica vein on Falcon Island, and it is possible that it may be the same vein.

The location of the new mill is yet to be determined and depends mostly on what freight rates can be arranged. If a rate on the finished material can be secured comparable to the rate on the raw material, the mill may be here or at the mine.—*Minneapolis* (Minn.) *Journal.*

J. B. John—The Man and His Work

One of a Series of Articles on Outstanding Executives in the Rock Products Industry—Their Business Philosophies

By Leon I. Thomas

WHEN you interview a modest man of achievement you have a far worse time of it than when you are called upon to see an executive who has done less and talks more. So it was that my getting the management philosophy of J. B. John was like pulling teeth. But perhaps if you will read this through to the end you will agree that my persistence in asking question after question was worth while.

From a business associate comes the following anecdote which rather well illustrates what is really at the heart of Mr. John's highly successful managerial ability. During the lunch hour, workmen will talk, yes, and gossip. Recently one of these noonday groups in one of Mr. John's plants was speculating as to whether or not the mill would "clean out" that season, which I believe is cement mill parlance for selling out the full production. "I don't believe we are going to do it," one man said. Then another piped up, "J. B. said we will, and when J. B. says we will, we will, and that's all there is to it." And there you have it—the ability to instill confidence.

"Sometimes it is hard to explain the remarkable confidence you can get from employes," Mr. John modestly told me. But is it? I began to doubt it after talking with him but a few minutes. The men know that he is looking after their best interests. He takes any amount of pains to show them that none of his companies intends to do a man wrong. I use the plural advisedly, for Mr. John is in the paradoxical situation of running four different companies, each of which competes against the other. There are four different boards of directors, and no interlocking, either.

Just to show the extent to which Mr. John is willing to go to straighten out matters between employes, let me cite one case which came to my attention. I believe it is typical. One of the foremen and an old trusted employe out in the plant disagreed on some point. They continued to disagree; neither could nor would get the other's viewpoint. After this had gone on for some time, the men finally said, "Let's put it up to J. B. Whatever he says goes with me." The foreman was reluctant to bother Mr. John with it, but since the man insisted, a telephone conversation ensued which brought the prompt and cheerful answer, "Sure, come in any time." At the interview the man presented his case well, but it was finally decided against him. However, he took it with good grace and is still a satisfied employe.

In many a company the head of the business would have dismissed the matter by telling the foreman that to decide it was his job; that that was what he was hired for.

J. B. John

And from that beginning the workman would have been made into a first-class grouch instead of the conscientious employe he now is.

Of course Mr. John hasn't time to hear every petty grievance any more than any other successful executive has. The case cited required a special handling because of the calibre of the people involved in it, but it shows the will to settle things with justice, no matter what the inconvenience caused. Normally, under Mr. John's management, the men get their grievances up to the top of the organization, and Mr. John gets his policies interpreted down in the ranks through certain key men. There are six of these men in each of his companies.

As Mr. John explained it, "I put explicit confidence in these men and they have similar confidence in me. They are superintendents, managers, and chemists, and sometimes a man out in the mill. But before they can become key men I must have known them personally for a long time, and they me. Then it is that I can rely thoroughly upon what they tell me.

"Then once a year I have a dinner for the whole force at which they hear my story of what we, as a company, are trying to accomplish."

"Rather simple," this getting along with employes, according to Mr. John. Being entirely frank with everybody is at the basis of the formula. "I believe in being just as frank with the water boy as with the heavy stockholder," says Mr. John, "and I have practiced it so long that the men believe fully what I say.

"I believe it is important to take the time to tell employes the why of everything. I am very particular not to allow the picayune things to deceive them. A man may have some very little thing done to him which he comes to think constitutes a 'raw deal.' I try to see that he gets a full explanation—just as complete an explanation as though it were a big matter which vitally concerned the executives of the business.

"It takes time, yes, but after you have built a background of the square deal over a long period of years, co-operative results are bound to show up."

But I have known other executives who seemed, at least, to have the same general point of view on the human side of management and yet who where not as successful in the actual working out of the principles. So I was led to ask Mr. John what, in his opinion, is the weakest spot in the handling of men in the average organization.

His answer was as unexpected as it was interesting. "It is the failure to strike a happy medium," he said. "On the one hand it is rather easy to slop over with what a sensible workman sets down as an excess of attention. This pretty soon ruins an organization. On the other hand, it is not difficult to be so absorbed with other phases of the business as to appear distant to the employes.

"Any self-respecting workman looks upon the head of a business as something of a fool if figuratively he goes out in the plant with a pocket full of gold dollars and scatters them around. Nor, on the other hand, does this self-respecting workman give the best that is in him to the head executive who is so far removed from the rank and file as to thoroughly unappreciative of the problem of the individual. Somewhere in between is

that pathway that leads to successful management."

Giving things away has no place in the handling of employes. The average workman despises charity, and rightly so, according to J. B. (Long before the hour's talk with Mr. John was up, I found myself so fully a captive to this executive's qualities of leadership that wherever there was occasion to set down Mr. John's name my notes began to read "J. B.," the same appellation which his men so familiarly and yet respectfully use.) Something for nothing is quite out of tune with successful management, in Mr. John's opinion. Like perpetual motion to an engineer, anything that savors of something for nothing is immediately discredited.

"Nor can you 'kid' workmen very long, even if you should want to. They can tell pretty shortly whether or not what you say is from the heart," says Mr. John. And then he added, "I want to repeat what I have already said, because it is so very important —that being absolutely frank with everyone is at the basis of all human relations which will stand up under the severe strains to which they sometimes have to be put."

Keeping so close to the employes and their individual achievements has led quite naturally, in all of Mr. John's companies, to the policy of beating a man to a raise in salary. "So it has become an unwritten law with us," says Mr. John, "not to ask for a raise. The men know that accomplishment is being watched and will be rewarded accordingly."

Coupled closely with this watching of accomplishment is the appraisal of ability to do more, with the result that responsibility is shoved upon young men just as fast as they are able to take it. Thus talent finds itself planted in fertile soil in Mr. John's companies.

"Another unwritten rule with us," says Mr. John, "is that if anyone finds himself in any trouble concerning human relations which he cannot fix up, he is not to let it brew into a more powerful annoyance, but should bring it to me right away. There's always some way out of it and that way is much easier if we apply first aid before the relatively small scratch becomes a festering wound.

"This should not be interpreted as meaning that I want every little thing brought to me. If I did, not only would my program be overtaxed, but there would grow up an organization of leaners rather than of executives standing squarely on their own feet. How well they settle things coming within their jurisdiction is a measure of their capability, but the point is that having exhausted all the available means of arriving at a mutually satisfactory understanding and failed, matters must not be left at that stage. There is always a way out and if the other executives cannot find it, it's up to me to help out if I can, and do it relatively soon, not after it's too late.

"It's the same way, too, with problems of all sorts, with production as well as with personnel 'stickers.' Somebody will find a way to solve your problem if you will only talk about it enough. Put it out in the open where everybody can see it. We listen to all suggestions from everyone, no matter how many. And above all we never make light of it, however ridiculous a suggestion may be. Not only is it lacking in good taste, but suicidal of the success of the future appeals to poke fun at a man for foolish but earnest suggestions."

When asked if he paid a specific reward for adopted suggestions, Mr. John said no and then amplified his answer with this, "Nor do we have any definite fixed system of awarding annual bonuses which I am in the habit of granting and which aim to take care of payment for special degrees of accomplishment in one way or another. Instead of any set formula for this, the men must have confidence in me and leave such awards to me. This may sound selfish, but the truth is I don't know of any way of making a hard and fast rule governing such things that will be at all equitable."

And why, one may ask, should anyone want cold rules of procedure in the presence of Mr. John's quiet, forceful, magnetic personality? His leadership can scarcely better be explained than it was by an executive in his industry, who said, "Even in his casual dealings with men he displays the deft tactfulness that leads but does not drive, inspires but does not preach, and that magnetizes a group of men into a unit."

Atlantic Gypsum Products Co. and Canada Cement Co. Combine Gypsum Operations

AN ARRANGEMENT of far reaching significance to the Eastern seaboard gypsum industry has just been made between the Canada Cement Co., Ltd., and the Atlantic Gypsum Products Co. This involves a consolidation of gypsum quarry operations, effective November 1, 1928, whereby all the crude gypsum rock from Nova Scotia used by those two companies will be produced by Atlantic Gypsum Products Co., instead of being handled separately, as at present. Atlantic Gypsum Products Co. will then furnish the Canada Cement Co. the latter's entire requirements of gypsum rock for its eastern Canadian plants. Further it involves the retirement of the Canada Cement Co., Ltd., as a manufacturer of gypsum products in the United States through the sale of its Pennsylvania Gypsum Co. plant and business to Atlantic Gypsum Products Co.

The Canada Cement Co., Ltd., has up to this time met its large requirements for crude gypsum rock for its eastern Canadian plants from its quarry at Ingonish, Cape Breton, Nova Scotia. In addition that company owns a large deposit of high-grade gypsum rock on tidewater at Antigonish, Nova Scotia. Under long-time contracts the Canada Cement Co. has furnished to Canada Gypsum & Alabastine Co., Ltd., the largest Canadian manufacturer of gypsum products, the crude rock requirements for its eastern Canadian business. The Canada Cement Co., Ltd., has also supplied all the gypsum rock for its subsidiary, Pennsylvania Gypsum Co. at its plant on the Delaware river at Chester, Penn., 12 miles from Philadelphia.

Atlantic Gypsum Products Co. has met its own requirements for crude gypsum rock for its North Atlantic seaboard markets from its quarries at Walton, Nova Scotia, and at Cheticamp, Cape Breton, both of which are on tidewater and capable of large-scale, low-cost operation in the supply of high-grade gypsum rock. It operates a long established gypsum products plant located on the East river in New York City, and a complete plant at Portsmouth, N. H., supplying the New England markets. Its raw material, crude gypsum rock, is naturally adapted to economic manufacture of gypsum products at seaboard plants, and is essential to most Eastern markets, especially to New England. Atlantic Gypsum Products Co.'s development program includes a logical expansion in these markets.

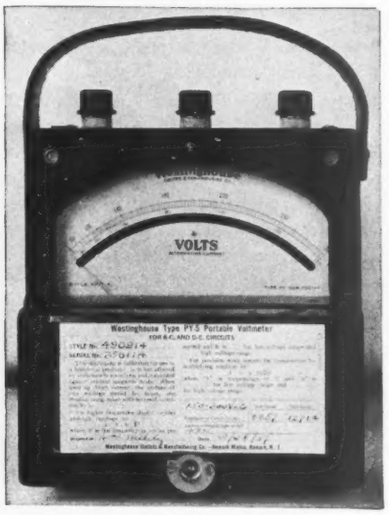
Under the new arrangement, the Atlantic Gypsum Products Co. takes over the plant and business of the Pennsylvania Gypsum Co., which supplies the Philadelphia, Baltimore and Washington markets from its tidewater plant at Chester, Penn. Under a long-time contract Atlantic will ship from its Cheticamp quarries all of the Canada Cement Co.'s gypsum rock requirements for its eastern Canadian cement plants. Other extensive deposits of gypsum rock, also favorably located for low-cost operation, including the Cape North, Cape Breton, deposit of Atlantic, and the Antigonish deposit of the Canada Cement Co. will be held in reserve for the future combined requirements of both companies.

This is one of the most important recent developments in the gypsum industry. It concentrates a very large quarry tonnage, with all the resulting economies, consolidates gypsum operations of hitherto divided interests on the Atlantic seaboard, and substantially extends the participation of American interests in these markets.

Cement in Paper Bags Goes Through Fire

THE WAREHOUSE of H. M. Franklin and Co., Tennille, Ga., was recently severely damaged by fire. The company was engaged in storing a shipment of portland cement in multi-wall paper bags. Some 50 bags were near the middle of the warehouse during the fire. Water was 3-in. deep on the floor of warehouse after the fire. The cement was not damaged and was sold in the original bags, according to report.

New Machinery and Equipment



New portable alternating current voltmeter

Portable Alternating Current Instruments

THE Westinghouse Electric and Manufacturing Co., East Pittsburgh, Penn., announces a new line of portable alternating-current instruments designated as type PY5. They are of the direct-reading type and are applicable for general testing and laboratory work where high accuracy is required, according to the manufacturers.

The voltmeters and single-phase wattmeters are of the electrodynometer type. The ammeters are of the moving iron type using vanes of non-residual metal. All instruments are shielded and are damped by an improved design of air damper making possible accurate measurements on fluctuating loads, it is claimed. The ammeters have a double range which can be changed while the meter is in use by a series-parallel switch mounted in the case. The movements are mechanically strong and will successfully stand momentary overloads, it is stated. They may be used on circuits up to 500 cycles and also on direct current with but slight reduction in accuracy. The voltmeters have an accuracy of ¼% and can be used without appreciable error on direct current and on alternating current up to 133 cycles, according to the manufacturers. The single-phase wattmeters have an accuracy of ¼% and may be used on circuits up to 400 cycles without requiring correction for phase displacement. The current circuits are double range with series-parallel arrangement of coils, and are controlled by a switch inside the instrument operated by a knob in a recess in the case. Voltage ranges are changed by changing the terminal connections.

New Plaster Mixer Equipped With a Hoist

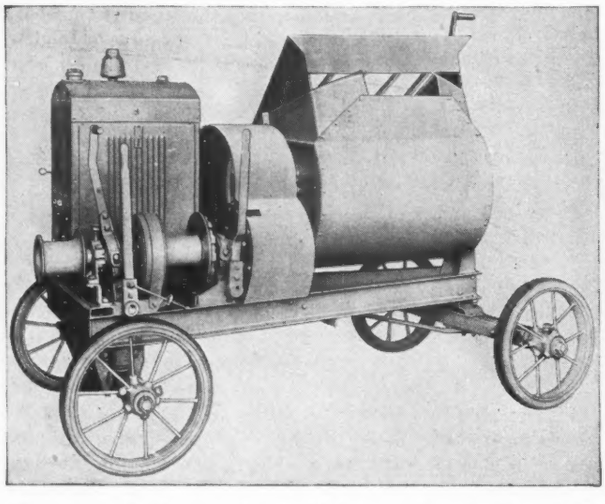
THE Marsh-Capron Co., Chicago, has announced the installation of a hoist on its plaster mixer, which is known as the "Mechanical Hoeman." The hoist is mounted on the counter shaft of the mixer, and can be operated independently while mixing. It is provided with an automatic brake which holds the load when the clutch is disengaged. The large winch head projects in the front of the machine, making it easily adapted for the operation of elevators or other hoisting work. The hoist is also provided with a safety ratchet and with automatic lubrication by compression grease cups. The standard engine equipment has been found to give ample power for a large amount of hoisting work, it is claimed.

Another improvement recently announced on this plaster mixer is a new stuffing box on the hoe shaft. A semi-metallic packing is used in an outside stuffing box mounted in a cast head in the drum head casting. The packing can be changed at any time without dismantling any other part of the machine and the packing glands can be tightened while the shaft is revolving. An open space between the stuffing box gland and the bearing prevents plaster from working into the bearing housing, it is claimed, thus assuring long bearing life. The machine is provided in two styles of mounting —a four-wheel rubber-tired trailer, with telescoping steel hauling hitch where a high degree of portability is desirable, or on truck with four steel wheels.

The "Mechanical Hoeman" is provided with a mixing hoe formed of steel bars especially shaped to give rapid, thorough mixing and complete scraping of the barrel at every revolution. Discharge is effected by rotating the drum, the discharge spout being part of the drum itself and so shaped as to confine the batch to a narrow stream, permitting discharge directly into wheelbarrows.

The completely enclosed two-cylinder hopper-cooled LeRoi or Novo engine is continued as standard equipment, with electric motor drive optional. This equipment turns the hoe shaft at a speed of 24 r.p.m.

Such plaster mixers have been used successfully for mixing concrete on several jobs recently. A contractor on a school in Buffalo, N. Y., mixed all of his floor concrete



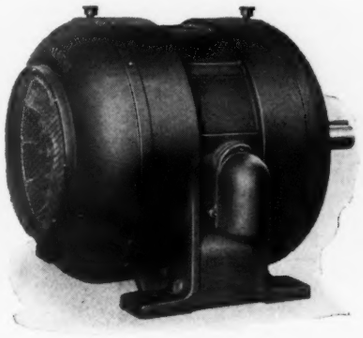
New type of plaster mixer which is equipped with a hoist for work around the job

Plaster mixer being used for mixing concrete of different colors for top surfacing concrete floors

in this machine, setting the blades about ⅛-in. away from the drum, so there would be no trouble caused by stones catching between the drum and the blades. On another job the plaster mixer was used to prepare terrazzo, the company states.

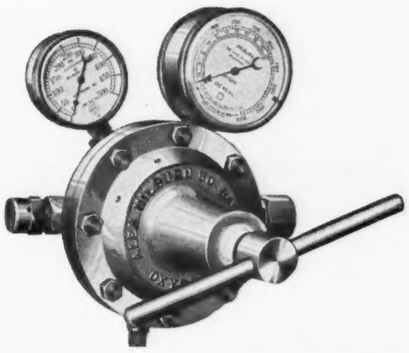
New Line of Totally Enclosed Motors

A NEW line of totally-enclosed, fan-cooled motors, of 1 to 50 hp., has been announced by Allis-Chalmers Mfg. Co. of Milwaukee, Wis. In this new design, all of the active parts, such as stator core, stator winding and the rotor, are completely enclosed, preventing contact of outside air, dirt, dust, fumes and moisture with the interior or



Totally enclosed, fan-cooled motor

active parts, it is claimed. Heat is carried away by a cooling air forced around and across those parts which conducts the heat from the interior to the outer surfaces. A circumferential air jacket controls the path of this cooling air. Solid cast iron bearing housings are attached to the stator end heads with a machined fit, which, with grease packed bearings, form a perfect end closure. The internal parts of the motor are readily accessible by removal of housings, it is stated. A feature is that in many ratings this totally enclosed design delivers the same horsepower output as is obtained from the same frame in the standard open rating, the manufacturers claim. Temperature rise is within 55 deg. C., measured by the resistance method, the company states. The design provides for a most rugged construction with a minimum number of parts, according to the announcement of the manufacturers.



Regulator for governing large quantities of gas

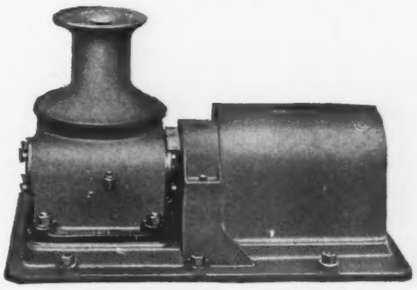
New Regulator for Gas Pressure

THE Alexander Milburn Co., Baltimore, Md., has announced a new regulator for the control of gas pressures, known as the "Super Master" regulator. This new device is stated to have been specially designed for use in operations where a large volume of gas or a great number of outlets are to be controlled, and also to be particularly designed so that its parts are readily accessible. The manufacturers state that the regulator is of sturdy construction, suitable for the hardest usage. A special feature is the safety blow-off valve. These regulators are equipped with 3000-lb. initial gages and 500-lb. delivery gages.

The floating operating pin is of monel metal, combining resistance to oxidation and corrosion with a high tensile strength. The diaphragm is of special bronze. The seat of the regulator is closed by the spring acting with the pressure instead of against it, which enables the seating to be effected by a pressure of only a few pounds instead of hundreds of pounds, thus eliminating the possibility of damage, according to the manufacturer.

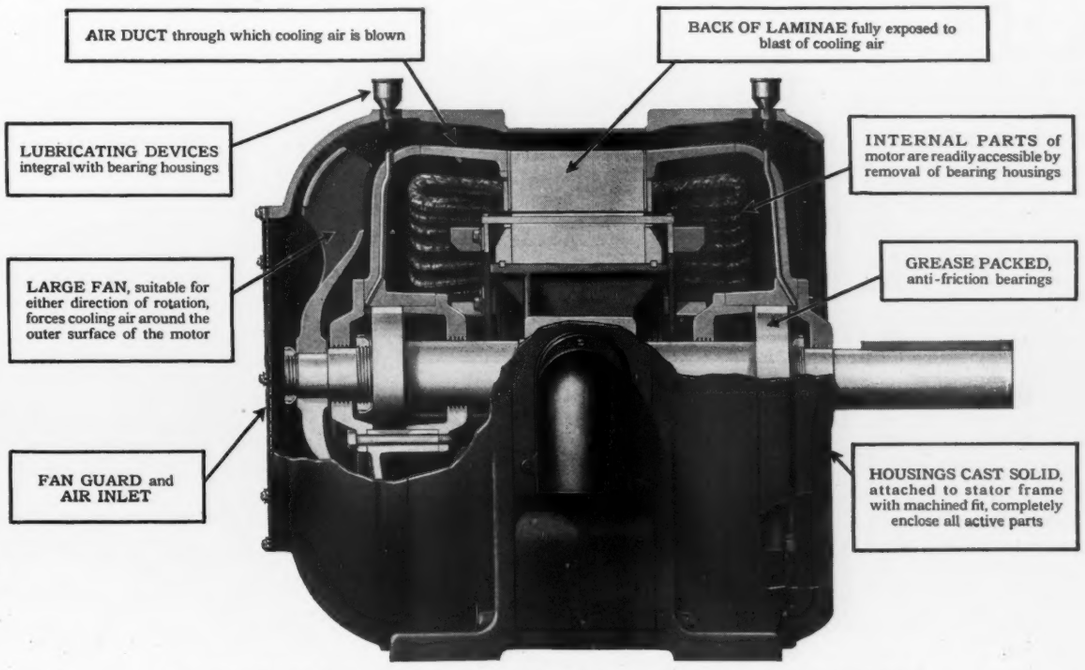
New Capstan-Type Car Puller

THE Weller Manufacturing Co., Chicago, have announced a new upright, electrically-operated capstan type car puller to round out the company's line of horizontal, capstan and drum types of car moving equipment. The new type car puller, which is made in two sizes, is a small, compact, self-contained unit, occupying very little space. It is said



New capstan- type car spotter

to be easily operated and to be practically fool-proof, and it is claimed that it will pull in any direction or at any angle. It is controlled entirely by the touch of a button, and the consumption of power, and hence the expense, of operating, is claimed to be remarkably small. The smaller of the two new units, known as C-1, will develop a pull equal to the full strength of a 1¼-in. manila rope, the manufacturers state, and will pull from 1 to 3 cars. The other unit, C-2, will develop a pull equal to the full strength of 1½-in. manila rope, and will pull from 3 to 6 cars, it is stated.



Sectional view of totally enclosed motor indicating the various features

Highway Research Board's Annual Meeting

THE Highway Research Board's Eighth Annual Meeting will be held December 13 and 14, 1928, at the National Academy of Sciences and National Research Council building, Washington, D. C.

According to a communication from Roy W. Crum, director of the National Research Council, all persons interested in any phase of highway development are invited to attend.

Topics to be discussed will include, methods for taking care of unusual drainage and other subgrade conditions, and also methods for design of pavements. New developments in finishing bituminous surfaces, factors to be considered in correlation of soil and pavement conditions, design of guard rail based upon extensive research in Pennsylvania, properties of bituminous materials for surface treated roads, safety on highways as affected by rural or urban conditions, degree of improvement of roadway, light or heavy traffic, increasing volume of traffic, effect of width of roadway and various physical conditions upon carrying capacity, the Maryland aerial traffic survey between Washington and Baltimore, methods used in promoting the financing of state highway systems, sound economic principles in financing road improvements and research work of the National Safety Council will be discussed.

Buffalo, N. Y., Can't Be Enjoined From Spoiling Gravel Deposit

SUIT BROUGHT by the Squaw Island Freight and Terminal Co. against the city of Buffalo, N. Y., to collect $775,000 damages for the alleged destruction of sand and gravel deposits in Niagara river, near Squaw island, was dismissed recently in a decision handed down by Justice Harley N. Crosby in state supreme court. Justice Crosby also denied application of the company for an injunction restraining the city from dumping sewage into the river at that point.

The company in its claim, filed direct with the court, alleged that accumulations of sewage on and below the water level had ruined the sand and gravel deposits of the company in the river near the island.

The suit was dismissed, Justice Crosby said in a prepared opinion, because of a technical error in the failure of the company to file its claim with the city. He declared the only remedy for the company was in court law suit for damages.

In denying the application for an injunction, Justice Crosby ruled that an injunction, granted at this time, would be of no benefit to the plaintiff. "An injunction," he wrote, "would have as little good as an injunction forbidding the cutting down of a tree that had long since been felled."

Work Begun on Idaho Cement Plant

GOOD PROGRESS is being made in connection with the preliminary work incident to the construction of the cement plant of the Idaho Portland Cement Co. at Inkom, Idaho, according to a statement of J. B. Maxfield, secretary-treasurer of the company.

Contract has been let for the reinforceed concrete stack, which will tower 150 ft. above the ground, with an inside diameter of 7 ft. 6 in. The General Concrete Construction Co. of Chicago was the successful bidder. Work on the concrete base for the stack is already under way. It will be 30 ft. square at the base and will be 9 ft. thick. Work on the stack construction will probably commence Saturday and should be completed in about a month, Mr. Maxfield states.

An Oregon Short Line R. R. crew has already commenced to lay ties and rails on the spur track which will serve the plant, which will necessitate bridging the Portneuf river. The spur and bridge will cost the company approximately $10,000, according to Mr. Maxfield.

Beginning next week work of excavating for heavy machinery foundations will be commenced. This will consist of eight concrete piers, each capable of supporting a moving weight of 150 tons.

Thirty-five men and 15 teams are being employed on the construction work, Mr. Maxfield states. The new gas power shovel has arrived, together with the large concrete mixer, compressor and hoist. Two carloads of quarrying machinery are expected to arrive this week and work of developing the quarry will be started at once, Mr. Maxfield stated.—*Pocatello* (Idaho) *Tribune.*

Right to Construct Railway Extension to Serve Cement Plant Denied

PUBLIC CONVENIENCE is not shown to require construction by the Grand Rapids and Indiana railway and the Pennsylvania railroad, lessee, of an extension in Petoskey, Mich., the Interstate Commerce Commission held in a decision in Finance Docket No. 6705, made public October 24. The purpose of the projected line was to serve the cement plant of the Petoskey Portland Cement Co., which is now served only by the Pere Marquette railway.

The commission rejected the Pennsylvania's application on the ground that all the traffic to be handled would be traffic diverted from the Pere Marquette and that the latter can handle with its present facilities at least four times the volume of traffic now moving to and from Petoskey and is prepared to expand its facilities whenever the need may arise.

Commissioner Eastman dissented from the majority report, asserting that he is not in sympathy with the idea that a carrier should have anything resembling a proprietary interest in traffic and that as this case is only of local significance, the views of the Michigan Public Utilities Commission, which favors the construction of the extension, ought to be given controlling weight.

Gravel Men Testify in Condemnation Proceedings

GRAVEL MEN summoned by the Iowa State Highway Commission recently declared that the D. J. Conn property along the new Lincoln Highway route west of Boone, Iowa, is not suitable for a large gravel plant.

This testimony was given by E. H. Laderbauch and R. C. Fletcher, two gravel operators of Des Moines, the evidence being introduced to offset some previously given for Mr. Conn, who is asking for a larger compensation for the taking of his property for the new highway than was allowed him by the sheriff's jury.

Mr. Lauderbach set the value of the Conn land on which there was gravel as not more than 25% greater than the value of the land in 1927. Objections by counsel for Mr. Conn to this testimony were overruled by Judge S. A. Clock, who is presiding at the trial.

A gravel plant now has a radius of shipment of 10 miles by motor truck or 35 to 40 miles by rail, R. C. Fletcher said. He stated it would require an investment of $40,000 on the Conn property to equip it to produce 15 cars of gravel daily. He said that the Conn deposit would not be profitable as a commercial gravel pit other than for the local trade.

"Do you know that there are 900 miles of roads in Boone county and about 200 miles of streets in the cities of the county which are not graveled?" asked former Judge Lee of Ames, an attorney for the appellant.

"Some like paving best," commented the witness.

"Not in this county," interposed Judge Clock and the court fans had a chance to laugh.—*Boone* (Ia.) *Republican.*

Suit on Silica Sand Tariff Dismissed

SUIT FOR INJUNCTION brought by the Nevada Silica Co. to compel Secretary of the Treasury Mellon to keep Belgian sand off the free tariff list has been dismissed by Justice Gordon in the District Supreme Court, Washington, D. C. The court held it had no jurisdiction.

Quality Machinery for Quality Products

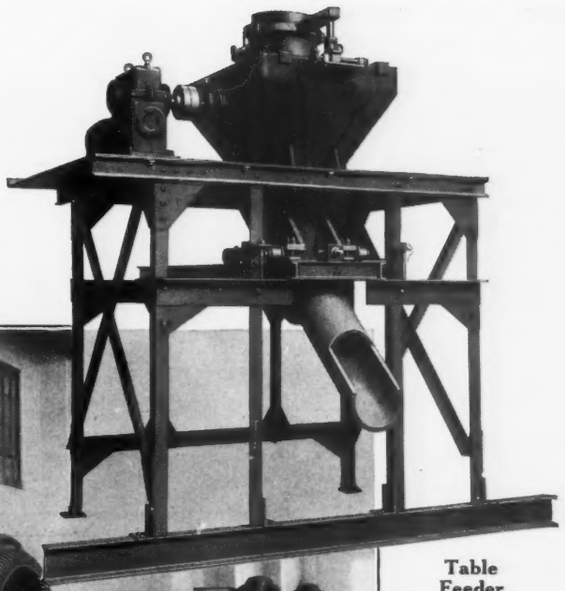
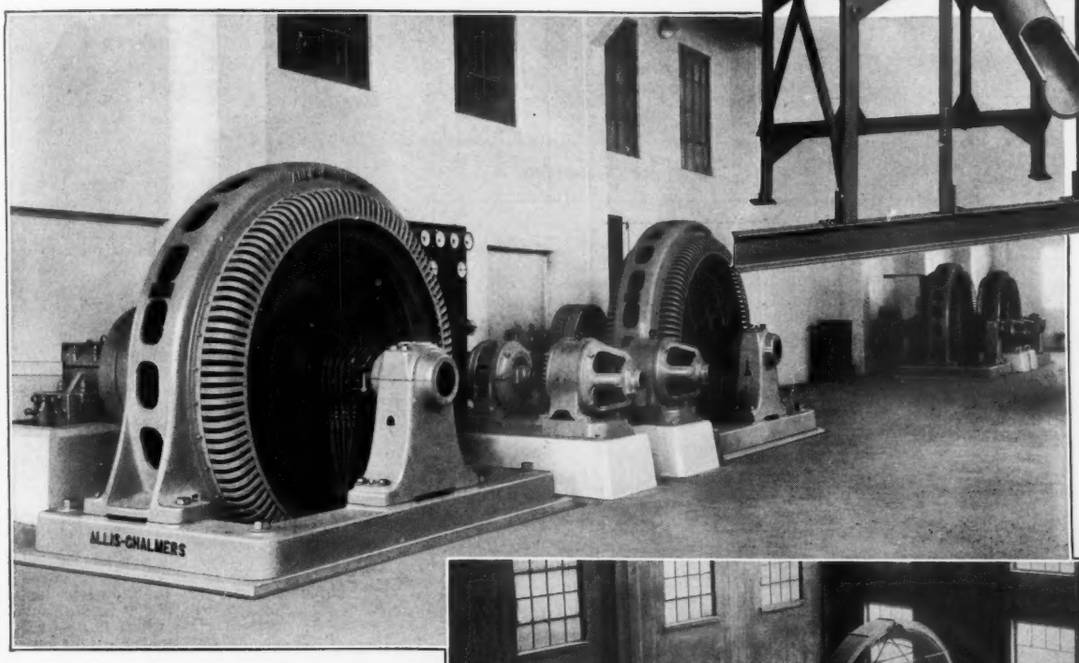


Table Feeder



Hytork Motors

Compeb Mills

EVERY producer appreciates that specifications for Portland Cement are constantly growing more stringent and that the quality of their product is dependent to a great extent on their feed regulating and grinding equipment. The Allis-Chalmers Manufacturing Company, with its testing laboratory and co-operation with the cement industry, has anticipated this demand.

Automatic Feeders have been designed in various types and sizes to control the correct proportions of raw material within close limits and to maintain the highest unit capacity.

Compeb Mills and Concavex grinding media have been designed to give the proper fineness of raw material and finished cement.

"Hytork" Synchronous Motors are direct connected to grinding mills without any unloading device such as a friction or a magnetic clutch and is capable not only of exerting unusually high starting and "pull in" torque with very little line disturbance at high power factor, but of operating at unity power factor.

Allis-Chalmers' cement machinery is noted the world over for its simplicity and economy of operation and the high quality of cement produced.

ALLIS-CHALMERS

MILWAUKEE, WIS. U.S.A.

News of All the Industry

Incorporations

Florida Mining and Manufacturing Corp., Tampa, Fla. John B. Blew, 1004 Central Ave.

Missouri-Kansas Gravel Co., Pittsburg, Kan., $5000.

Builders' Material and Supply Co., Wilmington, Del., 10,000 shares common, no par value.

Stone Products Co., Lockport, N. Y., $30,000. G. W. Riley.

Oxford Cement Products Co., Oxford, Penn., $5000. L. May Hopton.

Wink Gravel and Clay Co., Wink, Tex., $1000. G. F. Bates, W. L. Bates, Lilly Bates and others.

Homer J. Holl Gravel Co., North Canton, Ohio, $10,000. Marguerite Holl, Homer J. Holl, R. L. Oberlin.

Corona Silica, Inc., Rogers, Ark., $750,000. To mine and mill 300 tons daily of silica for use in cosmetics and for chemical purposes.

Wassaic Sand and Stone Corp., Amenia, N. Y., 1000 shares common, no par value. D. G. McCullough, Poughkeepsie, N. Y.

Innerkip Quarries, Ltd., Toronto, Canada. $500,000. James Franceschini, Toronto, and others. To develop and operate stone quarries.

Santa Clara Land Co., Santa Clara, N. Y., 750 shares, no par value. Arthur H. Trotter, Marion D. Clark, Friend D. Smith, 923 East Adams St., all of Syracuse, N. Y.

Maritime Portland Cement Co., Ltd., Brockville, Ont., Canada. 7500 shares of preferred stock and 20,000 shares common stock of no par value.

Monolithic Products Corp., Manhattan, N. Y., 2000 shares, par value $100. Harold L. Klein, Sophie Freeman, Meyer E. Schulman, all of New York City.

Soapstone Products, Inc., Asheville, N. C., 100 shares, no par value. To mine, mill and deal in soapstone. Robert S. Brown, Hugh C. Brown and Edwin L. Brown, all of Asheville.

Boston Nustone Corp., Everett, Mass., 100 shares without par value. To deal in cement tubs, tanks, etc. Harold W. Cook, Wallace S. Clark, 157 Tremont St., Everett, and Edward F. Cook.

Wade Sand and Gravel Co., Lilesville, N. C., authorized capital stock, $150,000, subscribed, $13,300. E. E. Wade, C. L. Jordan, W. H. Land of Lilesville, N. C.

Middlesex Sand and Gravel Co., Watertown, Mass., 999 shares, $100 par. Charles H. Hodges, treasurer; John S. Lovell, 15 Mason Rd., and Alan D. Brennan, all of Watertown.

Lillington Stone Co., Lillington, N. C., authorized capital $100,000, $3000 subscribed. To operate sand and gravel plant. G. D. Monroe, G. S. Loving, Lillington, N. C., and E. V. Webb of Klinston, N. C.

National Portland Cement Co., Houston, Tex., incorporated with $250,000 no par value stock to take over properties of Gates Chemical Co., North San Jacinto and Mary Sts., and to convert for manufacture of white cement; have daily capacity of 50 bbl.; Eugene S. Gates, director; H. J. Harris, 4425 Normandy St., Dallas, president; C. S. Atkinson, 3406 La Branch St., Boston, secretary-treasurer.

Quarries

Lima Stone Co., Lima, Ohio, has contracted to furnish its entire output to Henry Ford's Detroit, Toledo and Ironton R. R. Production will be doubled about April 1 of next year.

New Castle Lime and Stone Co., New Castle, Penn., is enlarging its quarry at Dunbar near Connellsville, Penn., it is reported. The present opening is 450 ft. in width. A steam shovel will widen this to 1500 ft.

Montreal, Que.; five workmen preparing a dynamite charge in a Montreal stone quarry were blown to fragments recently when the dynamite exploded prematurely. Four were married men and leave families.

Southern Lime Products Co., recently organized as subsidiary by S. J. Groves and Sons Co., Cordele, Ga., general contractor, has work under way on new quarrying and crushed stone plant at lime rock properties near city; later second unit will be built. Project is reported to cost more than $40,000.

Salem Quarries, Inc., Winston-Salem, N. C., H. C. Perkins, president, plans expansion program, to install machinery and equipment, construct spur line railway from Winston-Salem southbound tracks at Longview to Salem Quarries. Company produces ballast and aggregate, 500 tons per day.

Sand and Gravel

B. N. Bartlett, Portland, Ore., has purchased the plant of the Yakima Sand and Gravel Co., East Selah, Wash.

Pine Bluff Sand and Gravel Co., Pine Bluff, Ark., is completing a new office building on the river front, near the Cotton Belt railway shops.

Pacific Sand and Gravel Co., New Westminster, British Columbia, is making extensive additions to its plant and equipment.

J. P. Frain, of Kokomo, and **Walter Green**, of Franklinton, La., have leased 575 miles of land 4 miles south of Brookhaven, La., to engage in crushed-stone, sand and gravel production.

Vermilion Sand and Supply Co., Vermilion, Ohio, has closed a contract with the Toledo Shipbuilding Co., Toledo, for a motor sand boat to be completed late this season. The vessel will be 115 ft. long and 28-ft. beam.

Seaville Sand and Gravel Co., Seaville, N. Y., is electrifying its gravel-pit machinery with a 250-hp. motor. The pit, idle for several years, has been reopened for extensive operations. The company is developing silica sand. Power for the new motor will be supplied by the Atlantic City Electric Co.

Seaboard Sand and Gravel Co., New York City, are in controversy with the Mt. Sinai (L. I.) Civic Association over operations on the north shore of Long Island. The New York State Land Office has decided it will be necessary for the sand company to secure a state grant for land under water to proceed with necessary construction and development work. The operations of the sand company, it is alleged, are causing serious harm to public and private property along the waterfront, the civic association charges in a letter to the Brookhaven Town Board, and urges the latter to oppose the grant when it comes before the land board.

Cement

Alpha Portland Cement Co., Birmingham, Ala., entertained the senior class of the school of commerce, Alabama University, on a tour of its plant recently.

Northwestern States Portland Cement Co., Mason City, Iowa, has remodeled and redecorated its headquarters offices on the sixth floor of the First National Bank Bldg.

Pacific Coast Cement Co., Seattle, Wash., has been producing crushed limestone at its Dall Island, Alaska quarry for several months. Recently the first shipload was brought to Seattle in anticipation of the opening of the cement plant.

Kentucky Cement Corp., whose decision to build a 1,400,000-bbl. plant near Frankfort, Ky., was announced in ROCK PRODUCTS, October 27, has established offices in the Farmers' Deposit Bank Bldg., Frankfort. F. B. Drew, McAlester, Okla., is president. The Hunt Engineering Co., Kansas City, Mo., are engineers.

International Cement Corp., New York City, has just issued a leaflet "Saving 760,000 Detours with Incor." The leaflet contains information in regard to the use of the company's new quick-hardening cement, which according to tests of concrete used in the Boston post road, had a compressive strength of 2710 lb. in 1 day, 3860 lb. in 2 days and 5110 lb. in 5 days. The company has also recently announced a reduction in the price of Incor cement.

Sandusky Cement Co., Cleveland, Ohio; Alva Bradley, real estate operator and president of the Cleveland Baseball Club, has been elected a member of the board of directors. Mr. Bradley is also interested in shipping and is chairman of the board of the Cleveland and Buffalo Transit Co. J. B. John is president of the Sandusky Cement Co., and E. J. Maquire is secretary-treasurer. Other directors include Charles F. Brush, A. C. Dustin, Dan P. Eells, E. B. Greene, E. S. Hanson and William B. Newberry.

Pacific Coast Cement Co., Seattle, Wash.; the new 13-ton crane recently was placed in operation when unloading of the steamship Eastern Coast commenced. Members of the Engineers' Club were guests at a luncheon given to N. D. Moore, vice-president of the company, and viewed the operations. The crane is one of the largest in the West and cost more than $50,000. Four cubic yards of limestone are carried in each action of the crane. Following the luncheon in the office building an inspection of the plant was made prior to viewing the crane operations.

Florida Portland Cement Co., Tampa, Fla.; F. M. Traynor is quoted in local newspapers to the effect that October business was more than 20% above the total for the best previous month in the history of the plant, according to shipping figures. From 20 to 25 carloads of rock and clay are being brought into Tampa daily from the company's quarries at Brooksville. New state cement jobs expected to be awarded soon include about 35 miles of highway construction in Gadsden and Leon counties. Concrete is specified in the Gadsden county job, and it is one of several types specified in the Leon county project, Mr. Traynor said.

Lawrence Portland Cement Co., Thomaston, Me.; an editorial in the *Portland* (Me.) *Herald-Press* states: "In our state every possible encouragement is being given our new cement industry. All the cement that is being used in the construction of our highways is being bought from the Maine concern. President Walter S. Wyman of the Central Maine Power Co., which is now about to begin work on the construction of the enormous dam at Bingham, on the Kennebec river, has stipulated that all the cement that goes into this structure shall be Maine-made cement. Others are also trying to put this new and important Maine industry on its feet."

Atlas Portland Cement Co., Independence, Kan.; C. M. Carman is quoted in the local press: "We expect the present month to be the best we have had in the 24 years of operating the local plant." Heavy shipments of cement are being made daily and a double shift is being worked in the packing department. Shipments are going out to points in Texas, Minnesota and other states. The Atlas plant has lost but little time in the past few years, most of the shutdown time being necessary for repairs. There has not been a lost time accident in the plant since January 10, the best record in the history of the organization, and it is hoped to continue the unbroken record for some time to come.

Cement Products

Ready Mixed Concrete Corp., Minneapolis, Minn., has commenced the construction of central concrete mixing plant to cost about $50,000. The new plant will have a daily capacity of 800 cu. yd.

Leaside and Plaster, Ltd., Leaside, Ont., were "at home" to builders, contractors and architects of Toronto, who were invited to inspect the concrete products and cinder block plant of the company.

National Board of Fire Underwriters recently approved units of "Stone-Tile" manufactured by the **Halifax Concrete Products Co.**, Daytona, Fla., and by the Columbia Stone-Tile Co. of Columbia, S. C., according to the local press of the two cities.

Gypsum

United States Gypsum Co., Chicago, is reported to be planning to double the size of its Heath, Mont., plant in the near future, which will also double the production of the plant.

Atlantic Gypsum Products Co., 40 Rector street, New York, will build a one-story crushing plant with storage and distributing facilities in connection with the new gypsum products plant now nearing completion.

United States Gypsum Co., 300 West Adams street, Chicago, has awarded general contract to Morton C. Tuttle Co., 31 St. James avenue, Boston, engineer and contractor, for new plant at Philadelphia to manufacture wallboard, building tile, etc.

Pennsylvania Gypsum Co., Chester, Penn., has authorized an expansion and betterment program at its local mill, used for the manufacture of gypsum wall plaster, gypsum partition blocks and other kindred building products, including the installation of additional machinery, for a large increase in its present capacity. The company will also build a new pier for handling raw materials, and will provide complete mechanical equipment for unloading, conveying, etc. Plans are reported to be under way for the construction of a new branch mill at Brooklyn, N. Y. The entire project is expected to cost more than $200,000, including machinery.

Lime

Muscle Shoals White Lime Co. of Cherokee, Ala., has begun operations at a new plant having a capacity of 100 bbl. a day.

Rockland and Rockport Lime Corp., Rockland, Maine, announces the opening of new general offices at 50 East 42nd St., New York City, with Donal O'Connor as general sales manager of the associated companies—the Rockland and Rockport Lime Co. and the Hoosac Valley Lime Co.

Silica Sand

Corona Silica, Inc., H. R. McKnight, Tulsa, Okla., president, recently formed by Mr. McKnight and associates with capital of $750,000, plans development of silica properties near Rogers, Ark., including construction of grinding and refining mill. Project will cost over $400,000.

Personals

R. E. Roscoe, supervising chemist, Alpha Portland Cement Co., Birmingham, Ala., addressed the Alabama section of the American Chemical Society recently on "The Manufacture of Cement."

Bertrand C. Wheeler, who has been advertising manager of the Marquette Cement Manufacturing Co., Chicago and Memphis, for the past seven years, and for the last year also manager, "Super-Cement" division, has left to affiliate with *Chicago Golfer*. In addition to participating in the management of the magazine. Mr. Wheeler will serve as advertising director.

J. H. Dalbey, who was for years identified with the Dixie Portland Cement Co., Chattanooga, Tenn., as its sales manager and continued in that post when consolidation with the Pennsylvania-Dixie Cement Corp. was effected, has become identified with the Cherokee Building Material Co. of Chattanooga, in which he acquired an interest, and is now serving it as vice-president and general manager.

Captain William B. Rodgers, president of the Rodgers Sand and Gravel Co., Pittsburgh, Penn., will be one of the principal speakers in the tenth annual convention of the Mississippi Valley Association, St. Louis, November 26 and 27. Among the other speakers are Dwight F. Davis, secretary of war; Senator James Reed of Missouri, Senator Henrik Shipstead, Minnesota; Congressmen Walter H. Newton of Minnesota, William E. Hull of Illinois and John H. McDuffie of Alabama; General Edgar Jadwin, chief of engineers; William R. Dawes, president of the Chicago Association of Commerce; Stewart Gillman, Greater Sioux City Committee; J. C. Nichols, Missouri River Navigation Association, Kansas City; M. J. Sanders, advisory board, Inland Waterways Corp., New Orleans, and Roy Miller, Intercoastal Canal Association, Corpus Christi.

Obituaries

D. N. Armstrong, vice-president and general manager of the Missouri Portland Cement Co., St. Louis, Mo., whose death on October 18 was recorded in ROCK PRODUCTS, October 27, was buried October 20 at his former home at Grimsby, Ont. He was 64 years old and had been with the Missouri Portland Cement Co. since 1910. He suffered a stroke of apoplexy while inspecting the Prospect Hill plant of the company. He is survived by a widow, Mrs. Jennie Armstrong.

Charles O. Ingalls, 62, president of the Ingalls Stone Co., Bedford, Ind., the largest independent stone company in the Indiana limestone district, died at his home on October 24 from a stroke of paralysis suffered 24 hours earlier. He was one of the most prominent operators in the limestone district here and was considered one of Bedford's first citizens. Mr. Ingalls came here from Binghamton, N. Y., in 1909. He was born in Oneonta, N. Y., April 11, 1866. Mr. Ingalls had three sons and one daughter who survive him.

William D. Kuebler, vice-president of the Best Block Co., Milwaukee, Wis., died of heart disease on October 22 at his home. Mr. Kuebler had been ill a month. He was 60 years old. Born on a farm near Fond du Lac he came to Milwaukee nearly 40 years ago. For ten years he operated the Kuebler Clothing Co. on upper Third St., near North Ave. In 1910 he founded the Best Block Co., makers of concrete blocks and building materials, and was its active head until eight years ago, when he retired. A year and a half ago he rejoined the company and was vice-president up to the time of his death. Mr. Kuebler is survived by his widow, Mrs. Addie Klocksin Kuebler; two sisters, Miss Lydia Kuebler, Evanston, Ill., and Mrs. Mary Peters, Milwaukee, and two brothers, John and Fred Kuebler, Oshkosh.

Manufacturers

Kennedy-Van Saun Manufacturing and Engineering Corp., New York City, has formed and established the Kennedy-Van Saun Co. of Illinois, with offices in the State Bank Bldg., 120 South La Salle St., Chicago. T. J. Shearer, manager, is in charge.

Huron Industries, Inc., has moved its general sales office from Alpena, Mich., to the Builders Bldg., Chicago, Ill. H. W. Munday, formerly editor-in-chief of *Pit and Quarry*, "Pit and Quarry Handbook" and the *Fertilizer Green Book*, has been appointed general sales manager of the company with offices in Chicago. Mr. Munday is a graduate engineer of Armour Institute of Technology and Purdue University.

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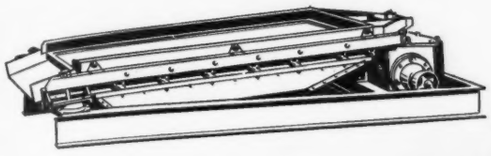

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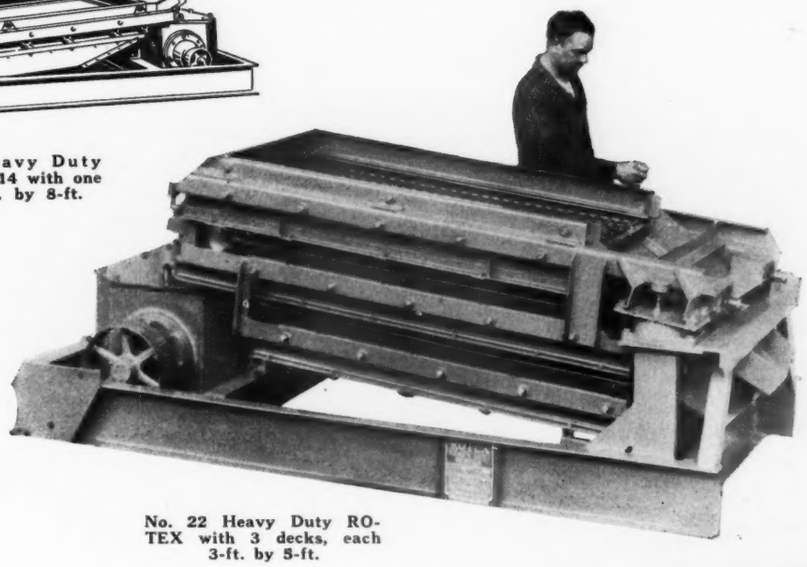

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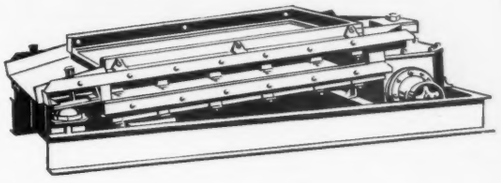

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